



FINAL

FINAL Environmental Assessment Building 3001

Tinker Air Force Base, Oklahoma

Contract No.: FA8101-08-D-0002

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Environmental Assessment Building 3001



September 2008



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Finding of No Significant Impact: Environmental Assessment Building 3001, Tinker AFB, Oklahoma

The United States Air Force (USAF) has prepared an Environmental Assessment (EA) that evaluates the potential environmental and socioeconomic impacts associated with proposed new facilities within Building 3001 located in the Air Logistics Area of Tinker Air Force Base (AFB), Oklahoma City, Oklahoma. Projects under consideration for Building 3001 include the installation of a new hangar door and concrete slab, and upgrade and replacement of utility infrastructure.

Description of the Proposed Action

The Proposed Action evaluated in this EA is the replacement and upgrade of utilities in Building 3001, construction of a new hangar door in the west side of Building 3001, and replacement of a concrete slab and pavement around the new hangar door in Building 3001 with concrete able to support heavier aircraft. All work would occur within the Air Logistics Area at Tinker AFB. Specific components of the Proposed Action include:

- Remove existing building addition (lean-to structure) on west side of Building 3001 to allow construction of new hangar door.
- Upgrade primary building utility system to serve entire industrial area
 - Install rooftop enclosure to house utility lines.
 - Upgrade secondary chiller water system to increase capacity and serve entire industrial area.
- Modify Building 3001
 - Replace approximately 20,000 square feet (approximately 200 feet by 100 feet) of existing concrete foundations and slab in the area of the new hangar door with reinforced concrete foundations and slab.
 - Install exterior masonry veneer and low-slope built-up roof
 - Rehabilitate existing dock area
 - Remove old pipes
- Construct a long span roof structure to allow for re-sizing of the doors
- Install new hangar doors on the west side of the building
- Paint ceiling and roof supporting trusses

It is anticipated that 18 months would be required to complete modifications to Building 3001.

Under the Proposed Action, the clean demolition debris from removal of the lean-to structure and existing concrete foundations and slab would be recycled and reused (if possible). Clean

demolition debris that is not recycled would be disposed of in an authorized construction and demolition debris landfill. Any materials removed from the existing structures that are determined to contain asbestos, lead, or other hazardous materials would be handled appropriately.

The Proposed Action, as described above, is the United States Air Force Preferred Alternative.

Alternatives

By definition, the No Action alternative is a continuation of existing conditions. Therefore, for this EA, the No Action alternative is continued operations at Tinker AFB without modifying Building 3001 as described above. Not modifying Building 3001 would result in further negative impacts to mission objectives due to lost work time related to utility outages, inefficient workspace, and inefficient movement of aircraft within Building 3001.

The following alternatives that were considered, determined not to be reasonable, and dismissed from detailed analysis in the EA.

Transfer maintenance of KC-135 aircraft to other USAF installations: Tinker AFB is currently designated as the Base responsible for the KC-135 aircraft. There are no other USAF installations that currently have the capability and infrastructure to perform depot level maintenance on the KC-135. It would be economically impractical to enhance the capability and infrastructure of another base in order to transfer this workload. Therefore, transferring maintenance of KC-135 aircraft to another USAF installation is not considered reasonable and is not further considered in this EA.

Transfer maintenance of KC-135 aircraft to other facilities on Tinker AFB: No other facilities that are available for use on Tinker AFB can accommodate KC-135 aircraft maintenance. Because there are no suitable facilities on Tinker AFB, this alternative is not considered reasonable and is not further considered in this EA.

Construct a new hangar for maintenance of KC-135 aircraft on Tinker AFB: There is insufficient undeveloped land not already sited for other uses in the ALA to accommodate a new building. As a result, relocation of KC-135 aircraft maintenance to a new facility on Tinker AFB is not considered reasonable and is not further considered in this EA.

Limit the number of KC-135 aircraft in Building 3001 for maintenance at any given time: The mission to maintain KC-135 aircraft is located at Tinker AFB. To restrict the number of aircraft receiving maintenance at any given time would result in a large backlog of aircraft requiring depot level maintenance. These aircraft would be unavailable for their intended mission, potentially leading to adverse impacts on national security. Delays would also result in unused maintenance space within Building 3001 and would not meet the need to have 19 aircraft in the maintenance work flow. Because of the potential for adverse impacts on the military mission and national security, limiting the number of aircraft in Building 3001 for maintenance was not considered viable. Therefore, this alternative is not considered reasonable and is not further considered in this EA.

Environmental Consequences


No unavoidable adverse environmental effects from the implementation of either the preferred alternative or the no-action alternative have been identified through this EA.

No long-term significant adverse effects and no unavoidable adverse environmental effects from the implementation of the proposed action have been identified through this EA. As a result, no long-term mitigation measures are required. Temporary soil disturbance and runoff potential during construction will be mitigated through the use of Best Management Practices (BMPs). Tinker AFB will implement any mitigation specified by the State Historic Preservation Office for Building 3001 as a result of the Section 106 process. All potential impacts and exposure to Asbestos Containing Material (ACM) would be minimized by compliance with the Tinker AFB Asbestos Abatement Specifications. All potential impacts and exposure to Lead-Based Paint (LBP) and Heavy Metal Dust would be minimized by following the Occupational Safety and Health Administration (OSHA) procedures for dealing with LBP and the Tinker AFB LBP Abatement Specifications for industrial facilities.

Conclusion

The attached EA was prepared pursuant to Air Force Instruction (AFI) 32-7061 and Council on Environmental Quality (CEQ) regulations (Title 40, U.S. Code, Parts 1500-1508) for implementing the procedural requirements of the National Environmental Policy Act (NEPA). The finding of this EA is that the Proposed Action will have no significant impact on the human or natural environment. Therefore, a Finding of No Significant Impact (FONSI) statement is issued for the proposed action, and no Environmental Impact Statement (EIS) is required.

Approved: _____



ALLEN J. JAMERSON, Colonel, USAF
Commander

Date: _____

18 May 09

Executive Summary

Introduction

This environmental assessment (EA) evaluates the potential environmental and socioeconomic impacts associated with proposed new facilities within Building 3001 located in the Air Logistics Area of Tinker Air Force Base (AFB), Oklahoma City, Oklahoma. Projects under consideration for Building 3001 include the installation of a new hangar door and concrete slab, and upgrade and replacement of utility infrastructure.

Alternatives Considered

Proposed Action

The Proposed Action evaluated in this EA is the replacement and upgrade of utilities in Building 3001, construction of a new hangar door in the west side of Building 3001, and replacement of a concrete slab and pavement around the new hangar door in Building 3001 with concrete able to support heavier aircraft. All work would occur within the Air Logistics Area at Tinker AFB. Specific components of the Proposed Action include:

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 - Rehabilitate existing dock area
 - Remove old pipes
- Construct a long span roof structure to allow for re-sizing of the doors
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It is anticipated that 18 months would be required to complete modifications to Building 3001.

Under the Proposed Action, the clean demolition debris from removal of the lean-to structure and existing concrete foundations and slab would be recycled and reused (if possible). Clean demolition debris that is not recycled would be disposed of in an authorized construction and demolition debris landfill. Any materials removed from the existing structures that are determined to contain asbestos, lead, or other hazardous materials would be handled appropriately.

The Proposed Action, as described above, is the United States Air Force Preferred Alternative.

No Action Alternative

By definition, the No Action alternative is a continuation of existing conditions. Therefore, for this EA, the No Action alternative is continued operations at Tinker AFB without modifying Building 3001 as described above. Not modifying Building 3001 would result in further negative impacts to mission objectives due to lost work time related to utility outages, inefficient workspace, and inefficient movement of aircraft within Building 3001.

Environmental, Social, and Economic Issues and Concerns

No significant environmental or socioeconomic issues or concerns have been identified for the Proposed Action. The expected effects of the Proposed Action on the environmental and socioeconomic issues that were analyzed are summarized in Table ES-1.

TABLE ES-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Mission Objectives	Beneficial impact by improving efficiency of maintenance operations in Building 3001. Utility infrastructure upgrade and replacement would support increasing demands on maintenance operations.	Continued adverse impacts due to delays related to complicated logistics in maneuvering aircraft into and around maintenance facility. Further degradation of utility infrastructure could lead to additional pipeline failures, flooding, and maintenance delays. Could jeopardize mission objectives of organization.
Topography	Minor, temporary impacts from construction. Some excavation activities but all in flat, currently paved areas. No long-term impacts anticipated.	No Impacts as no change from existing conditions.
Soils	Minor, temporary impacts from construction. Some soil disturbance but precautions in place to limit removal of soil on site, and erosion control best management practices (BMPs) to be employed. No long-term impacts anticipated.	No Impacts as no change from existing conditions.

TABLE ES-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Air Quality	Short-term localized emissions from construction vehicles and fugitive dust. Generation of demolition dust possible. Temporary heating, ventilation, and air conditioning modifications and implementation of appropriate BMPs to control dust would be utilized. Possible exposure to contaminated groundwater plume vapors. Work area to be isolated (workers with personal protective equipment) and new concrete to be sealed to prevent vapors from entering Building 3001.	No impacts as no change from existing conditions.
Surface Water	No surface waters in vicinity of construction area. Potential for stormwater runoff from construction site to receiving streams. Stormwater BMPs would be used to minimize impacts. Some modification of runoff systems may be required. No long-term impacts anticipated.	No impacts as no change from existing conditions.
Employment	Beneficial impact from additional short-term construction employment. No long-term impacts as no additional (permanent) staff proposed.	No impacts as no change from existing conditions.
Income	Beneficial impact from additional short-term construction spending. No long-term impacts as no additional expenditure proposed.	No impacts as no change from existing conditions.
Installation Contribution to Local Economy	Beneficial impact to local economy due to slight increase in utility expenditures. Compared to overall impact of installation on economy, the impact would be negligible.	No impacts as no change from existing conditions.
Utility Infrastructure	Beneficial impact due to upgrade of utility infrastructure, resulting in more reliable future utility service. Beneficial impact from new hangar door construction due to more efficient movement of aircraft. Temporary adverse impact due to disruption of utility service in building during construction activities. Other negligible impacts would include relocation of drainage infrastructure (curbs, gutters, etc), and generation of construction-related debris and waste during construction to be disposed of offsite (no impact to Tinker AFB solid waste system).	Long-term adverse impacts due to continued deterioration of utility infrastructure, resulting in higher incidence of flooding, equipment failure, and maintenance delays.
Transportation	Temporary impact during construction (more vehicles on roads and at Tinker AFB access gates). No long-term impacts anticipated.	No impacts as no change from existing conditions.
Asbestos-Containing Materials (ACM)	Removal or demolition construction activities may result in exposure to ACM. All potential impacts and exposure would be minimized by contractor compliance with the Tinker AFB Asbestos Abatement Specifications. No impacts from ACM expected due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Lead-Based Paint (LBP)	Removal of steel, ductwork, and piping may result in potential exposure to LBP. Contractor required to follow Occupational Safety and Health Administration (OSHA) procedures for dealing with LBP and Tinker AFB Lead-Based Paint Abatement Specifications for industrial facilities. No impacts from LBP anticipated due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.

TABLE ES-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Heavy Metal Dust	Removal of steel, ductwork, and piping may result in potential exposure to heavy metal dust. Contractor required to collect dust through filtered vacuum systems and properly dispose of the hazardous waste. Due to similar hazard as LBP (fine particulate), contractor would be required to follow OSHA procedures for dealing with LBP and Tinker AFB Lead-Based Paint Abatement Specifications for industrial facilities. No impacts from heavy metal dust anticipated due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Contaminated Groundwater and Soils	Construction has potential to expose workers and Building 3001 employees to groundwater and soil contaminants. Engineering controls (including sealing new concrete floor) would be used to prevent vapor intrusion and exposure to contaminants. No impacts from soil and groundwater contamination due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Safety	Temporary impacts due to inherent health and safety risks related to construction activities. No impacts to the Tinker Bird/Wildlife Air Strike Hazard program would occur. Contractor would be required to follow all applicable OSHA regulations to minimize adverse impacts. No long-term impacts anticipated.	No impacts as no change from existing conditions.
Noise	Temporary impacts during construction activities but negligible compared to noise generated by nearby aircraft operations. No long-term impacts anticipated.	No impacts as no change from existing conditions.
Airspace/Air Operations	Construction activities to take place outside of airspace safety zones so no impacts to airspace safety. New hangar door construction resulting in reduction in aircraft movements would eliminate aircraft traffic conflicts and would have a long-term beneficial impact to airfield operations.	No impacts on airspace safety but continued adverse impacts on airfield operations due to shuffling of aircraft outside of Building 3001.
Cultural Resources	No impacts to cultural resources are anticipated. Area of construction has been heavily developed and disturbed in the past. However, the Tinker AFB inadvertent discovery procedures as specified in the Integrated Cultural Resources Management Plan (Hardlines Design Company, 2005) would be followed should unknown archeological resources be discovered during the work. Tinker AFB will implement any mitigation specified by the State Historic Preservation Office for the Historic District containing Building 3001.	No impacts as no change from existing conditions.
Aesthetics and Visual Resources	Slight modification to the appearance of Building 3001, but changed appearance would be consistent with typical airfield area views. Any impacts would be considered negligible.	No impacts as no change from existing conditions.

Environmental Compliance

Table ES-2 summarizes the status of compliance of the project with applicable federal environmental statutes and executive orders.

TABLE ES-2

Summary of Compliance with Federal Environmental Statutes and Executive Orders

Statutes	Compliance Status
Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469)	In compliance
Clean Air Act, as amended (Public Law 88-206)	In compliance
Clean Water Act, as amended (Public Law 95-217)	In compliance
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Public Law 96-510), as amended by the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499)	In compliance
Endangered Species Act of 1973, as amended (Public Law 93-205)	In compliance
Farmland Protection Policy Act of 1984 (7 U.S.C. 1539-1579)	In compliance
Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661, et seq.)	In compliance
Migratory Bird Treaty Act (16 USC 701, et seq.)	In compliance
National Environmental Policy Act of 1969 (Public Law 91-190)	In compliance
National Historic Preservation Act of 1966, as amended (Public Law 89-665)	In compliance
Noise Control Act of 1972, as amended	In compliance
Occupational Safety and Health Act of 1970, as amended (Public Law 91-956)	In compliance
Resource Conservation and Recovery Act (Public Law 94-580)	In compliance
Safe Drinking Water Act, as amended (Public Law 93-523)	In compliance
Solid Waste Disposal Act of 1965, as amended	In compliance
Toxic Substances Control Act of 1976 (Public Law 94-469)	In compliance
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. 1101, et seq.)	In compliance
Wetlands Conservation Act (Public Law 101-233)	In compliance
Executive Orders	
Floodplain Management (Executive Order 11988)	In compliance
Protection of Wetlands (Executive Order 11990)	In compliance
Federal Compliance with Pollution Standards (Executive Order 12088)	In compliance
Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898)	In compliance

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Abbreviations and Acronyms

AADT	Annual average daily traffic
ACOG	Association of Central Oklahoma Governments
AFB	Air Force Base
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFSC	Air Force Safety Center
AICUZ	Air Installation Compatible Use Zone
ALA	Air Logistics Area
APOE	Aerial Port of Embarkation
APZ	Accident potential zone
AQCR	Air Quality Control Region
AWAC	Airborne Warning and Control
BASH	Bird/Wildlife Aircraft Strike Hazard
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMP	Best management practice
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COTPA	Central Oklahoma Transportation and Parking Authority
CWA	Clean Water Act
dBA	A-Weighted Decibel
DCP	Dale-Canadian-Port
DESC	Defense Energy Supply Center
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
DS	Darnell-Stephenville
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
ES	Executive Summary
FY	Fiscal Year
gpm	Gallons per minute
HQ CEV	Headquarters, Civil Engineer Compliance
HVAC	Heating, ventilation, and air conditioning
I-	Interstate

LBP	Lead-based paint
MOA	Memorandum of Agreement
MSA	Metropolitan Statistical Area
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
OC-ALC	Oklahoma City Air Logistics Center
OCAMA	Oklahoma City Air Materiel Area
ODEQ	Oklahoma Department of Environmental Quality
ODWC	Oklahoma Department of Wildlife Conservation
OESC	Oklahoma Employment Security Commission
ONG	Oklahoma Natural Gas Company
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PDM	Programmed Depot Maintenance
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RVB	Renthin-Vernon-Bethany
SAF/MIQ	Secretary of The Air Force/Environmental Security
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SO ₂	Sulfur Dioxide
SPTG/SVY	Support Group Services
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic compound
WQA	Water Quality Act
WWTP	Wastewater Treatment Plant

1 Purpose and Need for the Proposed Action

1.1 Introduction

Tinker Air Force Base (AFB) has identified a need to modify Building 3001 to upgrade the building utility infrastructure and to accommodate larger aircraft more efficiently. The United States Air Force (USAF) proposes to upgrade the chilled water system, remove an existing structure on the Building 3001 exterior and install a new hangar door, and replace concrete pavement, in accordance with Unified Facilities Criteria (U.S. Army Corps of Engineers [USACE], 2006) and Air Force Handbook 32-1084 (USAF, 1996), where the new hangar door would be installed. The USAF has developed this Environmental Assessment (EA) to assess the potential environmental and socioeconomic impacts of the proposed project and any viable alternatives in accordance with 32 Code of Federal Regulations (CFR) Part 989, which established the USAF Environmental Impact Analysis Process (EIAP).

1.2 Location

Tinker AFB is located in Oklahoma City, in Oklahoma County, Oklahoma (Figure 1-1). The proposed project would be located in Building 3001 within the Air Logistics Area (ALA) on the eastern side of Tinker AFB (Figure 1-2).

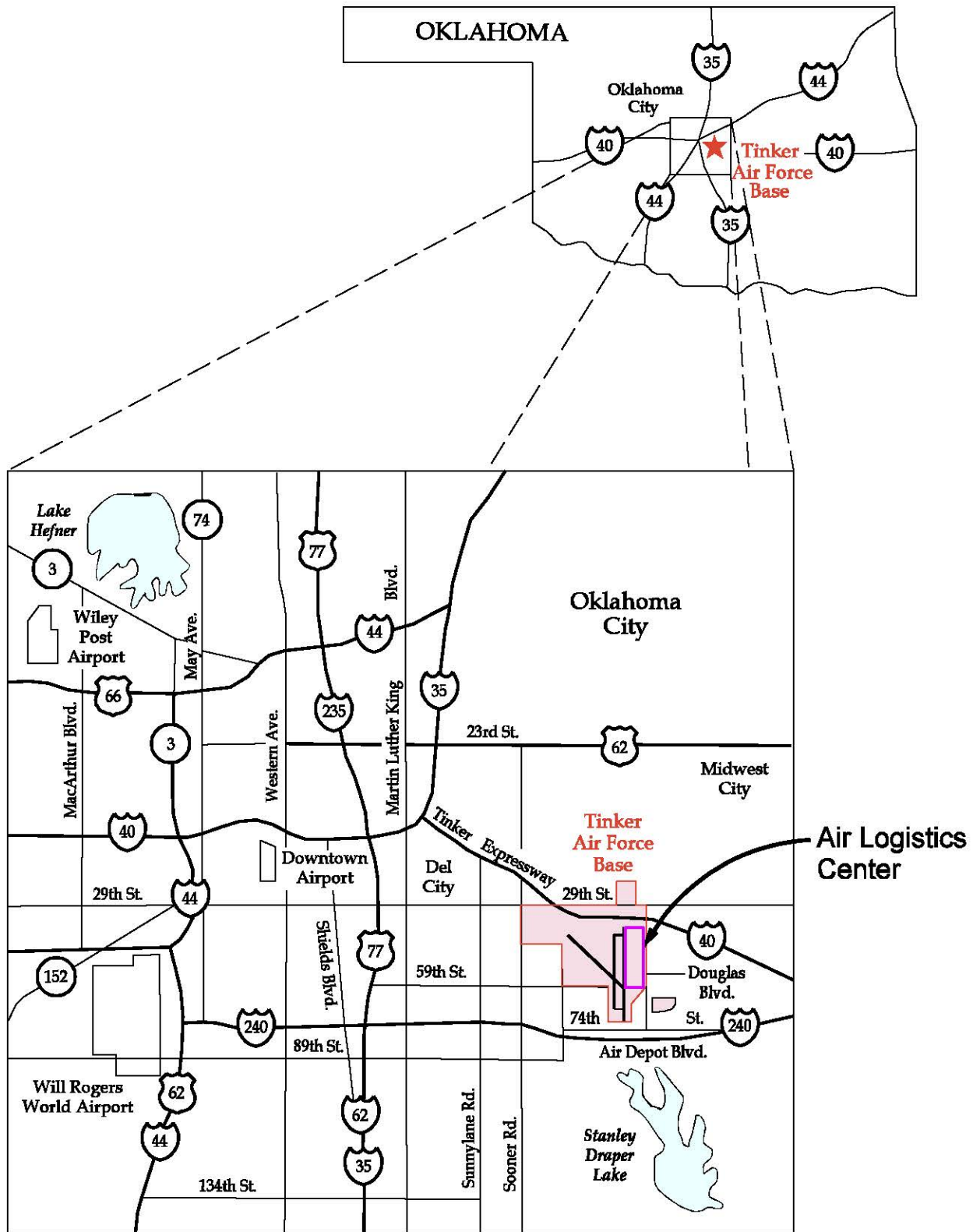
1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to increase the capacity of maintenance conducted on KC-135 aircraft to 19 aircraft in progress and increase maintenance efficiency. Building 3001 is approximately 60 years old and is not configured to meet the demands of modern aircraft Programmed Depot Maintenance (PDM) processes.

The USAF has determined that Tinker AFB must be capable of performing maintenance on 19 aircraft in the work flow for Building 3001 to meet its mission in support of war efforts. The need is associated with the requirement for the Oklahoma City Air Logistics Center (OC-ALC) to conduct PDM for the KC-135 aircraft. The nine KC-135 docks in Building 3001 are configured, relative to the two existing hangar doors, such that movement of aircraft to the docks is inefficient. Only one aircraft can be moved in or out of the maintenance area at a time. Six of the nine aircraft are blocked by other aircraft that must be moved before the blocked aircraft can be moved out of the building. The addition of a third hangar door in Building 3001 would make movement of aircraft within the building more efficient and reduce work stoppages related to aircraft movement.

The existing utility infrastructure in Building 3001 is outdated and insufficient to adequately support all maintenance activities in the industrial area. Chilled water is not currently supplied to the industrial area of Building 3001 at the proper pressure, which limits areas in which maintenance work can occur. The proposed utility work would upgrade the chilled

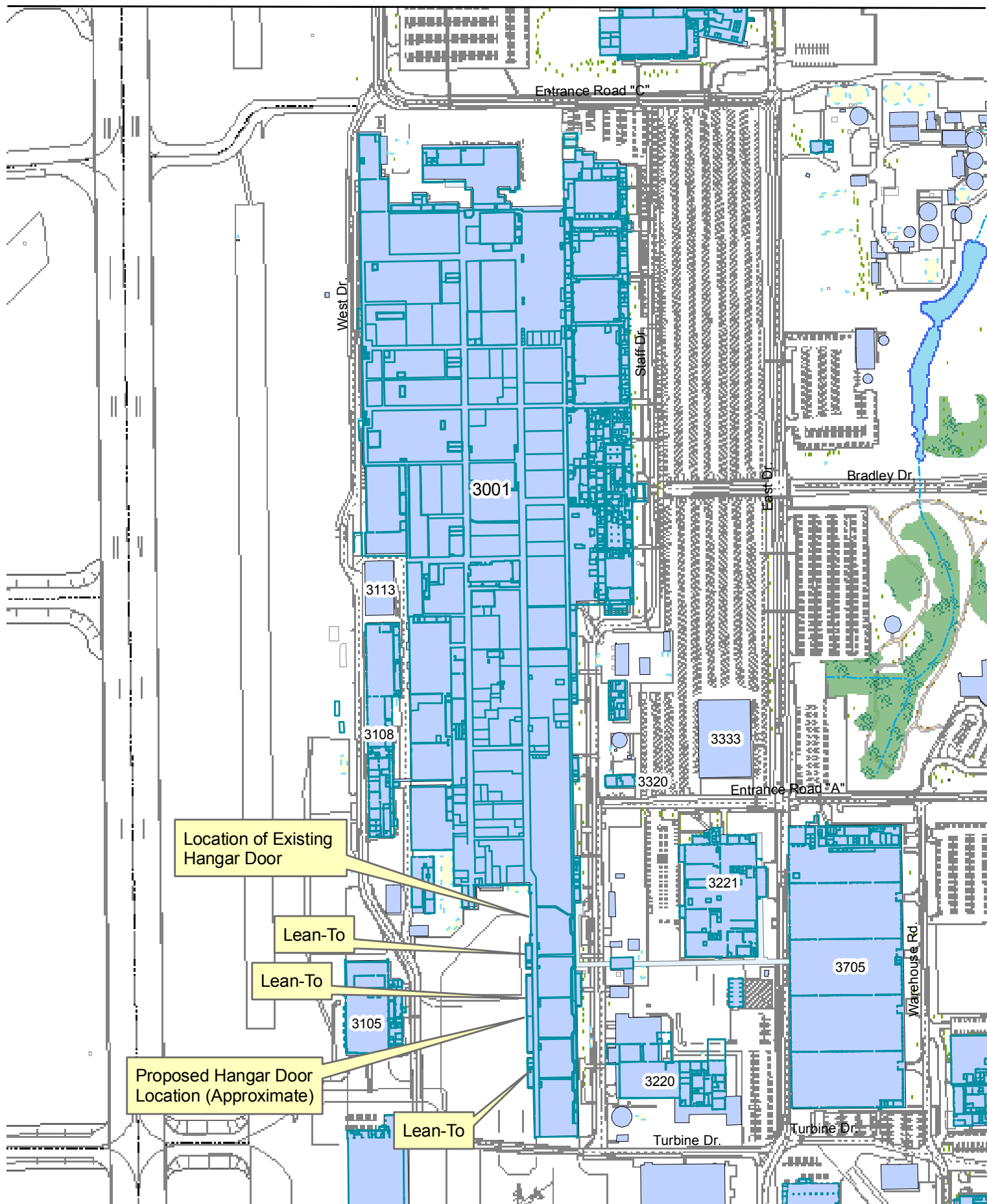
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SOURCE DATA: Tinker AFB GeoBase Program July 2006

CH2MHILL

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FIGURE 1-2
Project Alternatives
Building 3001 EA

Tinker Air Force Base, Oklahoma City, Oklahoma

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water to the industrial area, which would increase the efficiency of maintenance activity in Building 3001 and reduce the chance of chilled water system failure.

1.4 Decision to Be Made

USAF will decide, based on the analyses in this EA, other economic considerations, and operational considerations, whether to proceed with modification of Building 3001 through implementation of the Proposed Action, or to take no action.

1.5 Scope of the Environmental Analysis

The National Environmental Policy Act (NEPA) requires federal agencies to consider environmental consequences in their decision-making process. The Council on Environmental Quality (CEQ) issued regulations to implement NEPA; these regulations include provisions for both the content and the procedural aspects of the required environmental analysis. The EIAP, established in 32 CFR 989, is the mechanism used by the Air Force to ensure that its decisions are made with a complete understanding of the potential environmental consequences. The CEQ regulations are used with the EIAP to determine the appropriate level of environmental documentation required for a specific Proposed Action. The analysis in this EA assesses the potential environmental impacts of modifications to Building 3001.

1.5.1 Issues Considered for Detailed Analysis

Preliminary analysis of the Proposed Action identified multiple resource areas that could be impacted as a result of implementation of the Proposed Action. These resources are evaluated in detail in this EA. Issues analyzed in detail include:

- Mission Objectives
- Topography and Soils
- Air Quality
- Surface Water
- Economic Resources
- Utility Infrastructure
- Transportation
- Hazardous and Toxic Materials and Substances
- Safety
- Noise
- Airspace/Air Operations
- Cultural Resources
- Aesthetics and Visual Resources
- Cumulative Impacts

1.5.2 Issues Eliminated from Detailed Analysis

Consistent with 32 CFR 989 and the CEQ regulations, the scope of analysis presented in this EA is defined by the potential range of environmental impacts that would result from implementation of the Proposed Action or the No Action alternative. Resources that have a

potential for impacts were considered in more detail to provide the decision-makers with sufficient evidence and analysis for determining whether or not additional analysis is required pursuant to 40 CFR 1508.9.

Initial analyses indicate that the Proposed Action would not result in either short-term or long-term impacts to land use, geology, vegetation, wildlife, threatened and endangered species, wetlands, groundwater, population, medical services, housing, recreational facilities, police/fire protection, environmental justice, and protection of children. The reasons for not addressing these resources are briefly discussed in the following paragraphs.

Land Use. There would be no change in current land use under the Proposed Action. All work would be confined to the ALA and the project would support air operations at Tinker AFB. Because there would be no changes to current land use, this resource area is not examined further in this document.

Geology. The ALA is underlain by the Garber-Wellington Formation, composed primarily of sandstone and shale. The Proposed Action would involve shallow surface disturbance, limited to removal of existing concrete slab and replacement with stronger reinforced concrete slab that could support movement of the large aircraft, and would not extend to the underlying geology. Because construction would not have any effect on subsurface geological formations, this resource area is not examined further in this document.

Vegetation. All land that would be disturbed by the Proposed Action is currently paved or part of Building 3001. No vegetation would be disturbed. Because construction would not disturb vegetation, no impacts to this resource would result. Therefore, this resource area is not examined further in this document.

Wildlife. The Proposed Action would be implemented in an area where all land is either paved or covered by buildings. The land is fully developed and there is no habitat to support wildlife species within the project area. Because there is no suitable wildlife habitat, no wildlife would be expected in the project area and no impacts to wildlife would result. The area is fully developed, so it provides no suitable habitat for migratory birds. Therefore, this resource area is not examined further in this document. While wildlife resources are not specifically addressed in this EA, the United States Fish and Wildlife Service (USFWS) was provided an opportunity to comment on the document. No comments were received.

Threatened and Endangered Species. The Proposed Action would be implemented in an area where all land is either paved or covered by buildings. The land is fully developed and there is no habitat to support federal or state-listed threatened or endangered species in this area. Because there is no suitable habitat for protected species, no federal or state-listed protected species would be expected to occur in the area. No portion of Tinker AFB has been designated as critical habitat for threatened or endangered species by the USFWS. No impacts to threatened or endangered species or their designated critical habitat would result. Therefore, this resource area is not examined further in this document. While threatened and endangered species are not specifically addressed in this EA, the USFWS was provided an opportunity to comment on the document. No comments were received.

Groundwater. The area encompassed by Tinker AFB consists of both shallow alluvial and deep sandstone (bedrock) aquifers. The Base is situated over the Garber-Wellington aquifer, a sandstone aquifer that is the primary potable water supply source for the Base and several

surrounding communities (Association of Central Oklahoma Governments [ACOG], 2008). Depth to groundwater beneath Building 3001 is approximately 10 feet below ground surface in most locations (Flaming, 2008, personal communication). No subsurface work or subsurface wells are planned. As such, no impacts to groundwater resources are anticipated as a result of implementation and this resource area is not further examined in this document. However, there is an area of groundwater contamination in the vicinity of the Proposed Action. This contamination is addressed in the EA in the consideration of hazardous materials and waste.

Wetlands. There are five jurisdictional wetlands located on Tinker AFB; however, none are located within the ALA. As the Proposed Action is confined to Building 3001 and adjacent paved areas and is not adjacent to any wetland areas, no impacts to wetlands are anticipated as a result of implementation. As such, this resource area is not examined further in this document.

Population, Medical Services, Housing, Recreational Facilities, and Police/Fire Protection. According to the 2000 Census, the Oklahoma City Metropolitan Statistical Area (MSA) had a population of approximately 1.1 million. In 2007, Oklahoma Department of Commerce population estimates indicate the Oklahoma City MSA has a population of approximately 1.2 million. Tinker AFB has a total population of slightly over 29,600 inclusive of active-duty military, civilian employees, and military dependents (Tinker AFB, 2007a). The Proposed Action does not involve transfer or addition of personnel to the Tinker AFB community and as such, would not result in an increase in population. As no increase in population would result, no change in demands for medical services, housing, recreational facilities, or police/fire protection would result. There would be no change in the current demand on the Tinker AFB Fire Department to respond to emergencies. As there are no anticipated impacts to these areas, they are not further examined in this document.

Environmental Justice: The Proposed Action would be confined to the ALA on Tinker AFB and no impacts would extend outside the installation. There is no potential for the Proposed Action to disproportionately impact minority or low-income populations. Accordingly, this resource area is not examined further in this EA.

Protection of Children: The Proposed Action would be confined to the ALA on Tinker AFB and no impacts would extend outside the installation. There is a child daycare facility on Tinker AFB within 0.5 mile of the northern edge of Building 3001, but there is no potential for the Proposed Action to create environmental health or safety risks to children. Therefore, this resource area is not examined further in this document.

1.6 Applicable Regulatory Requirements and Coordination

This section provides a summary of the most applicable environmental and socioeconomic regulations, consultation requirements, and public involvement issues pertaining to the Proposed Action.

1.6.1 Applicable Federal and State Laws

1.6.1.1 Environmental Policy

The NEPA of 1969 and 40 CFR 1500-1508 require federal agencies to consider the potential environmental consequences of Proposed Actions and alternatives. Department of Defense (DoD) Directive 6050.1 (32 CFR 214) provides DoD policies and procedures to supplement 40 CFR 1500-1508. 32 CFR 989 establishes the USAF EIAP for implementing NEPA, including responsibilities, compliance requirements, and document preparation and processing standards. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality (amended by EO 11991), provides policy directing the federal government to take leadership in protecting and enhancing the environment.

1.6.1.2 Biological Resources (Vegetation and Habitat, Wildlife, and Threatened and Endangered Species)

The Endangered Species Act of 1973 (16 U.S. Code [USC] (1531-1543) provides policy for federal agencies (with assistance of the Secretaries of the Interior and Commerce) to ensure that their actions do not jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of critical habitat of such species.

The Fish and Wildlife Coordination Act provides policy for the Secretary of the Interior (through the USFWS) and for the National Marine Fisheries Service (NMFS) (through the Secretary of Commerce) to assist and cooperate with federal, state, and public or private agencies and organizations in the conservation and rehabilitation of wildlife.

The Migratory Bird Treaty Act (16 USC 701, et seq.) provides for the protection of migratory birds. It forbids, among other things, the taking, import, possession, purchase, or selling of migratory birds, with the exception of government-sanctioned hunting and capture of birds.

Title 29, Chapter 1, Article 5, Section 412 of the Oklahoma Statutes (O.S. §5-412) protects species and subspecies that have been designated as threatened or endangered by the State of Oklahoma.

1.6.1.3 Wetlands

The Clean Water Act (CWA) of 1977 and the Water Quality Act (WQA) of 1987 (33 USC 1251 et seq., as amended) provide policy for protecting wetlands and other waters of the United States. Section 404 of the CWA requires permits from the USACE to discharge dredged or fill material into such systems. EO 11990, Protection of Wetlands, requires federal agencies to minimize or avoid adverse impacts to wetlands and to preserve and enhance their beneficial values. 32 CFR 989 requires EAs prepared for actions for which the Air Force has wetlands compliance responsibilities to go through Headquarters Civil Engineering, Compliance to the Secretary of the Air Force/Environmental Security (HQ CEV to SAF/MIQ) for approval.

1.6.1.4 Land Use

EO 12372, Intergovernmental Review of Federal Programs, directs federal agencies to consult with and solicit concerns and comments from state and local governments that have jurisdiction over an area within which a federal action is proposed. The Farmland Protection

Act of 1981 (7 USC 4201 et. seq., as amended) requires federal agencies to consult with the Natural Resources Conservation Service (NRCS) to ensure that preservation/conservation of important farmlands is considered in federal actions.

1.6.1.5 Hazardous Substances

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (as amended by the Superfund Amendments and Reauthorization Act [SARA] of 1986) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and cleanup of inactive hazardous substance disposal sites.

The Resource Conservation and Recovery Act (RCRA) of 1976 provides policy for proper disposal of solid waste and establishes standards and procedures for the handling, storage, treatment, and disposal of hazardous wastes.

The Toxic Substances Control Act (TSCA) provides policy for proper handling of polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint (LBP).

1.6.1.6 Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 (16 USC 470 et seq., as amended) provides policy for the protection of historic resources when federal actions are implemented. Protection of Historic Properties (36 CFR 800) provides specific procedures that federal agencies must implement, such as consulting with the State Historic Preservation Office (SHPO), to ensure compliance with the NHPA.

The Archeological Resources Protection Act of 1979 requires federal agencies to conduct archaeological investigations on lands under their jurisdiction to determine the nature and extent of the protected cultural resources present, and to help manage extant resources in accordance with permit and enforcement provisions of the Act.

1.6.1.7 Water Resources

The CWA of 1977 and the WQA of 1987 provide federal policy on maintaining and restoring water quality to protect and enhance waters of the United States. Section 404 of the CWA requires permits from the USACE to discharge dredged or fill material into waters of the United States.

EO 11988, Floodplain Management, provides federal policy for reducing flood damage risk, minimizing the impacts of floods potentially resulting from a federal action, and preserving the natural and beneficial values provided by floodplains/floodways.

32 CFR 989 requires HQ CEV to obtain SAF/MIQ approval on EAs prepared for actions for which the Air Force has floodplain compliance responsibilities.

1.6.1.8 Air Quality

The Clean Air Act (CAA) (42 USC 7401 et seq., as amended) provides policy directing federal agencies to protect and enhance air quality. The CAA also requires agencies to verify that Proposed Actions conform to state implementation plans for attaining air quality goals.

1.6.1.9 Noise

The Noise Control Act of 1972 provides policy that directs federal agencies to limit noise emissions to within compliance levels.

1.6.1.10 Social

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides policy directing federal agencies to evaluate the effects of Proposed Actions on minority communities and low-income communities. Effects to be evaluated include human health, social, environmental, and economic.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, provides policy directing federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children.

1.6.2 Consultation Requirements

Tinker AFB is developing a Memorandum of Agreement (MOA) with the SHPO and the Oklahoma Archaeological Survey regarding the potential effects the Proposed Action may have on the Historic District containing Building 3001. Tinker AFB will implement all mitigation specified in the MOA once it is finalized. Because of the level of development in the project area, no impacts to protected species are anticipated. No initial coordination with USFWS and the Oklahoma Department of Wildlife Conservation (ODWC) has been conducted. However, both USFWS and ODWC were provided the opportunity to comment on the EA. No comments were received.

1.6.3 Environmental Permitting

No environmental permits or associated regulatory requirements have been identified for the Proposed Action.

1.6.4 Public Involvement

NEPA requires that the government provide the public with an opportunity to review and provide input on the Proposed Action and its potential environmental impacts prior to the government decision. The USAF made the Draft Final Environmental Assessment available for public review and comment from August 7 through September 8, 2008. A notice of availability was run in the most widely circulated local newspaper, *The Oklahoman*, on August 6 and August 7, 2008 informing the public of the public review period and the location of the document for review: the Tinker Information Repository at the Midwest City Library located at Reno and Midwest Boulevard. No comments were received during the public review period. A copy of the notice of availability is included in Appendix A.

1.7 Organization of the EA

This EA discusses the applicable regulatory requirements and existing conditions that serve as the context to evaluate the potential environmental and socioeconomic impacts associated with the Proposed Action and alternatives. Based on the nature of the Proposed Action and the affected environment, this EA evaluates the type and extent of all potential environmental and socioeconomic impacts associated with the Proposed Action.

Section 1 of this EA defines the purpose and need for the Proposed Action.

Section 2 describes the Proposed Action and No Action alternative.

Section 3 provides general information on existing conditions and describes the environmental, economic, and social resources that may potentially be affected by the project alternatives.

Section 4 discusses the environmental and socioeconomic consequences (impacts) associated with the Proposed Action.

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2 Description of the Proposed Action and Alternatives (DOPAA)

2.1 Introduction

This section of the EA describes the Proposed Action and the No Action alternative, and discusses other alternatives that were considered but dismissed from detailed analysis. The Proposed Action is the replacement and upgrade of utilities in Building 3001, removal of an existing “lean-to” structure on the west side of the exterior of Building 3001, construction of a new hangar door on the west side of Building 3001, and replacement of the concrete slab in the area of the new hangar door in Building 3001 with concrete able to support heavier aircraft. All work would occur within the ALA at Tinker AFB, Oklahoma City, Oklahoma.

2.2 History of the Formulation of Alternatives

NEPA and 32 CFR 989 require consideration of reasonable alternatives to the Proposed Action. The actions examined within this EA are proposed to meet mission requirements and to allow more efficient utilization of USAF resources. The Proposed Action is in support of the Depot overhaul of jet engines, aircraft, and engine component parts, and PDM activities on KC-135 aircraft conducted in Building 3001 on Tinker AFB. Only alternatives that would reasonably meet the defined need for the Proposed Action, would be technologically feasible, would be economically viable, and would not adversely impact the military mission of Tinker AFB are carried forward for detailed analysis in this EA.

Building 3001 is near the east boundary of Tinker AFB. The west wall of the building is the only feasible location for a new hangar door. The proposed new utility lines would be placed on the roof of the building. It is not economically viable to place these lines below the building due to the added cost of excavation and floor repair. In addition, placing utility lines beneath the building would be more disruptive of ongoing maintenance activities and would risk disruption of contaminated soil associated with past contamination under Building 3001. For these reasons, variations on the Proposed Action are not considered.

The following sections describe alternatives that were considered and dismissed from detailed analysis in the EA and alternatives that were considered and carried forward for detailed analysis.

2.2.1 Alternatives Dismissed from Detailed Analysis

This section discusses alternatives that were considered, determined not to be reasonable, and dismissed from detailed analysis in the EA.

Transfer maintenance of KC-135 aircraft to other USAF installations: Tinker AFB is currently designated as the Base responsible for the KC-135 aircraft. There are no other USAF installations that currently have the capability and infrastructure to perform depot

level maintenance on the KC-135. It would be economically impractical to enhance the capability and infrastructure of another base in order to transfer this workload. Therefore, transferring maintenance of KC-135 aircraft to another USAF installation is not considered reasonable and is not further considered in this EA.

Transfer maintenance of KC-135 aircraft to other facilities on Tinker AFB: No other facilities that are available for use on Tinker AFB can accommodate KC-135 aircraft maintenance. Because there are no suitable facilities on Tinker AFB, this alternative is not considered reasonable and is not further considered in this EA.

Construct a new hangar for maintenance of KC-135 aircraft on Tinker AFB: There is insufficient undeveloped land not already sited for other uses in the ALA to accommodate a new building. As a result, relocation of KC-135 aircraft maintenance to a new facility on Tinker AFB is not considered reasonable and is not further considered in this EA.

Limit the number of KC-135 aircraft in Building 3001 for maintenance at any given time: The mission to maintain KC-135 aircraft is located at Tinker AFB. To restrict the number of aircraft receiving maintenance at any given time would result in a large backlog of aircraft requiring depot level maintenance. These aircraft would be unavailable for their intended mission, potentially leading to adverse impacts on national security. Delays would also result in unused maintenance space within Building 3001 and would not meet the need to have 19 aircraft in the maintenance work flow. Because of the potential for adverse impacts on the military mission and national security, limiting the number of aircraft in Building 3001 for maintenance was not considered viable. Therefore, this alternative is not considered reasonable and is not further considered in this EA.

2.2.2 Alternatives Carried Forward for Analysis

This section briefly describes the alternatives that were considered and carried forward for detailed analysis in this EA. The following sections provide more detailed information on these alternatives.

Make no modifications to Building 3001 and continue current maintenance practices for KC-135 aircraft: Although this alternative would not meet the underlying purpose and need as stated previously, NEPA requires the evaluation of the No Action alternative as a baseline for comparison of potential impacts. Therefore, to make no modifications to Building 3001 and continue current maintenance practices for KC-135 aircraft is carried forward for further consideration as the No Action alternative.

Modify Building 3001 to enhance efficiency of maintenance for KC-135 aircraft: Modification of Building 3001 to include upgrade of the chilled water system, removal of an existing lean-to structure on the west side of the exterior of Building 3001 and construction of a new hangar door, and replacement of the existing concrete slab is both economically viable and technically feasible. This alternative would result in increased efficiency in the use of USAF resources directed toward maintenance of KC-135 aircraft. Accordingly, this alternative is carried forward as the "Proposed Action."

2.3 Proposed Action

The Proposed Action evaluated in this EA is the replacement and upgrade of utilities in Building 3001, construction of a new hangar door in the west side of Building 3001, and replacement of concrete slab and pavement around the new hangar door in Building 3001 with stronger reinforced concrete able to support heavier aircraft. All work would occur within the ALA at Tinker AFB. Specific components of the Proposed Action include:

- Remove existing building addition (lean-to structure) on west side of Building 3001 to allow construction of new hangar door.
- Upgrade primary building utility system to serve entire industrial area
 - Install rooftop enclosure to house utility lines.
 - Upgrade secondary chiller water system to increase capacity and serve entire industrial area.
- Modify Building 3001
 - Replace approximately 20,000 square feet (approximately 200 feet by 100 feet) of existing concrete foundations and slab in the area of the new hangar door with reinforced concrete foundations and slab.
 - Install exterior masonry veneer and low-slope built-up roof
 - Rehabilitate existing dock area
 - Remove old pipes
- Construct a long span roof structure to allow for re-sizing of the doors
- Install new hangar doors on the west side of the building
- Paint ceiling and roof supporting trusses

The stronger reinforced concrete would be in accordance with Unified Facilities Criteria (USACE, 2006) and Air Force Handbook 32-1084 (USAF, 1996). It is anticipated that 18 months would be required to complete modifications to Building 3001.

Under the Proposed Action, the clean demolition debris from removal of the lean-to structure and existing concrete foundations and slab would be recycled and reused (if possible). Clean demolition debris that is not recycled would be disposed of in an authorized construction and demolition debris landfill. Any materials removed from the existing structures that are determined to contain asbestos, lead, or other hazardous materials would be handled appropriately.

The Proposed Action, as described above, is the USAF Preferred Alternative.

2.4 No Action Alternative

By definition, the No Action alternative is a continuation of existing conditions. Therefore, for this EA, the No Action alternative is continued operations at Tinker AFB without

modifying Building 3001 as described above. Not modifying Building 3001 would result in further negative impacts to mission objectives due to lost work time related to utility outages, inefficient workspace, and inefficient movement of aircraft within Building 3001.

2.5 Comparison Matrix of the Environmental Effects of the Alternatives

The environmental and socioeconomic effects of the Proposed Action and the No Action alternative are summarized in Table 2-1. Resources excluded from analysis in this EA are not addressed in the table. Section 4 of this EA provides more detailed information on the effects of each alternative.

TABLE 2-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Mission Objectives	Beneficial impact by improving efficiency of maintenance operations in Building 3001. Utility infrastructure upgrade and replacement would support increasing demands on maintenance operations.	Continued adverse impacts due to delays related to complicated logistics in maneuvering aircraft into and around maintenance facility. Further degradation of utility infrastructure could lead to additional pipeline failures, flooding, and maintenance delays. Could jeopardize mission objectives of organization.
Topography	Minor, temporary impacts from construction. Some excavation activities but all in flat, currently paved areas. No long-term impacts anticipated.	No Impacts as no change from existing conditions.
Soils	Minor, temporary impacts from construction. Some soil disturbance but precautions in place to limit removal of soil on site, and erosion control best management practices (BMPs) to be employed. No long-term impacts anticipated.	No Impacts as no change from existing conditions.
Air Quality	Short-term localized emissions from construction vehicles and fugitive dust. Generation of demolition dust possible. Temporary heating, ventilation, and air conditioning modifications and implementation of appropriate BMPs to control dust would be utilized. Possible exposure to contaminated groundwater plume vapors. Work area to be isolated (workers with personal protective equipment) and new concrete to be sealed to prevent vapors from entering Building 3001.	No impacts as no change from existing conditions.
Surface Water	No surface waters in vicinity of construction area. Potential for stormwater runoff from construction site to receiving streams. Stormwater BMPs would be used to minimize impacts. Some modification of runoff systems may be required. No long-term impacts anticipated.	No impacts as no change from existing conditions.

TABLE 2-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Employment	Beneficial impact from additional short-term construction employment. No long-term impacts as no additional (permanent) staff proposed.	No impacts as no change from existing conditions.
Income	Beneficial impact from additional short-term construction spending. No long-term impacts as no additional expenditure proposed.	No impacts as no change from existing conditions.
Installation Contribution to Local Economy	Beneficial impact to local economy due to slight increase in utility expenditures. Compared to overall impact of installation on economy, the impact would be negligible.	No impacts as no change from existing conditions.
Utility Infrastructure	Beneficial impact due to upgrade of utility infrastructure, resulting in more reliable future utility service. Beneficial impact from new hangar door construction due to more efficient movement of aircraft. Temporary adverse impact due to disruption of utility service in building during construction activities. Other negligible impacts would include relocation of drainage infrastructure (curbs, gutters, etc), and generation of construction -related debris and waste during construction to be disposed of offsite (no impact to Tinker AFB solid waste system).	Long-term adverse impacts due to continued deterioration of utility infrastructure, resulting in higher incidence of flooding, equipment failure, and maintenance delays.
Transportation	Temporary impact during construction (more vehicles on roads and at Tinker AFB access gates). No long-term impacts anticipated.	No impacts as no change from existing conditions.
Asbestos-Containing Materials (ACM)	Removal or demolition construction activities may result in exposure to ACM. All potential impacts and exposure would be minimized by contractor compliance with the Tinker AFB Asbestos Abatement Specifications. No impacts from ACM expected due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Lead-Based Paint (LBP)	Removal of steel, ductwork, and piping may result in potential exposure to LBP. Contractor required to follow Occupational Safety and Health Administration (OSHA) procedures for dealing with LBP and Tinker AFB Lead-Based Paint Abatement Specifications for industrial facilities. No impacts from LBP anticipated due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.

TABLE 2-1
Comparative Impact Summary

Resource Area	Preferred Alternative	No Action Alternative
Heavy Metal Dust	Removal of steel, ductwork, and piping may result in potential exposure to heavy metal dust. Contractor required to collect dust through filtered vacuum systems and properly dispose of the hazardous waste. Due to similar hazard as LBP (fine particulate), contractor would be required to follow OSHA procedures for dealing with LBP and Tinker AFB Lead-Based Paint Abatement Specifications for industrial facilities. No impacts from heavy metal dust anticipated due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Contaminated Groundwater and Soils	Construction has potential to expose workers and Building 3001 employees to groundwater and soil contaminants. Engineering controls (including sealing new concrete floor) would be used to prevent vapor intrusion and exposure to contaminants. No impacts from soil and groundwater contamination due to implementation of proper handling and disposal techniques.	No impacts as no change from existing conditions.
Safety	Temporary impacts due to inherent health and safety risks related to construction activities. No impacts to the Tinker Bird/Wildlife Air Strike Hazard program would occur. Contractor would be required to follow all applicable OSHA regulations to minimize adverse impacts. No long-term impacts anticipated.	No impacts as no change from existing conditions.
Noise	Temporary impacts during construction activities but negligible compared to noise generated by nearby aircraft operations. No long-term impacts anticipated.	No impacts as no change from existing conditions.
Airspace/Air Operations	Construction activities to take place outside of airspace safety zones so no impacts to airspace safety. New hangar door construction resulting in reduction in aircraft movements would eliminate aircraft traffic conflicts and would have a long-term beneficial impact to airfield operations.	No impacts on airspace safety but continued adverse impacts on airfield operations due to shuffling of aircraft outside of Building 3001.
Cultural Resources	No impacts to cultural resources are anticipated. Area of construction has been heavily developed and disturbed in the past. However, the Tinker AFB inadvertent discovery procedures as specified in the Integrated Cultural Resources Management Plan (Hardlines Design Company, 2005) would be followed should unknown archeological resources be discovered during the work. Tinker AFB will implement any mitigation specified by the State Historic Preservation Office for the Historic District containing Building 3001	No impacts as no change from existing conditions.
Aesthetics and Visual Resources	Slight modification to the appearance of Building 3001, but changed appearance would be consistent with typical airfield area views. Any impacts would be considered negligible.	No impacts as no change from existing conditions.

3 Affected Environment

3.1 Introduction

This section discusses the environmental, social, and economic resources that may be affected by the Proposed Action or the No Action alternative. The components of the affected environment discussed in this section are those for which impacts have been identified, or those which require regulatory consultation or EO compliance. The following resource areas are discussed within this section: topography and soils; air quality; surface water; economic resources (employment and income); utility infrastructure (water, wastewater, stormwater, electricity, natural gas, liquid fuels, and solid waste); transportation; hazardous and toxic materials and wastes; safety; noise; airspace/air operations; cultural resources; and aesthetics and visual resources.

3.2 Location, History, and Current Mission of the Installation

Tinker AFB is located in Oklahoma County in the southeastern city limits of Oklahoma City, Oklahoma. The Base covers more than 5,000 acres and abuts Midwest City to the north and Del City to the west.

Tinker AFB began operations in 1941, when Oklahoma City was selected as a location for a maintenance and supply depot from the War Department. Immediately following World War II, Tinker AFB expanded to include the Douglas aircraft assembly plant and the name was changed to the Oklahoma City Air Materiel Area (OCAMA). OCAMA was overhauled in the 1950s to accommodate the B-52 bomber and KC-135 tanker. In the 1960s, Tinker AFB began to support additional aircraft including the J57, TF30, and J79 engines. In 1967, Tinker AFB was designated an inland aerial port of embarkation (APOE) for Southeast Asia. During the 1970s, Tinker AFB assumed management of new weapons, including the A-7D Corsair, E-3A Airborne Warning and Control (AWAC) aircraft, E-4 Airborne Command Post aircraft, and air- and ground-launched missiles. In 1974, Tinker AFB was renamed the OC-ALC. During the following years, Tinker AFB added support for the B-1 Bomber, medium-range surface-to-air missile, and F108-100 engine. The 28th Air Division was activated to handle the expanded E-3 AWAC operations. In 1991, two Navy E-6 squadrons were added to maintain a flying/communications link between the White House and ballistic missile submarines around the world.

Today, the OC-ALC is responsible for depot level maintenance of the B-1B Lancer, E-3 Sentry, B-52 Bomber, C/KC-135, E-6B Mercury, and other contractor logistics support aircraft (Tinker AFB, 2007a). In depot level maintenance, aircraft are brought to the OC-ALC for maintenance activities and then returned to the installations at which they are stationed. The OC-ALC is also responsible for system management and logistics support of the B-2 Spirit (Stealth Bomber) and Air Force One. Other responsibilities of the OC-ALC include the oversight of 23,000 aircraft engines and a multitude of missile systems for the DoD. The OC-

ALC is one of three depot level maintenance facilities in the Air Force Materiel Command (AFMC) (Tinker AFB, 2007a).

3.3 Description of the Project Area

3.3.1 Topography and Soils

3.3.1.1 Topography

Tinker AFB is located in the Central Redbed Plains section of the Central Lowland Physiographic Province. The Central Lowland Province is characterized by level to gently rolling hills, broad flat plains, and bottomlands intersected by small- to medium-sized streams and drainages. Oklahoma County elevations range from about 850 feet above mean sea level (MSL) in the southeastern part to over 1,300 feet MSL in the northwestern part. Base elevations range from approximately 1,200 feet MSL along Crutch Creek in the northwestern portion of Base to 1,310 feet MSL in the southeastern portion of Base.

The ALA consists of relatively flat lands that are heavily developed and maintained.

3.3.1.2 Soils

The Tinker AFB soil survey was completed in 1983 and updated in 1991 by the U.S. Department of Agriculture (USDA) NRCS. Tinker AFB lies within three major soil associations: Darnell-Stephenville (DS) Association, Dale-Canadian-Port (DCP) Association, and Renthin-Vernon-Bethany (RVB) Association (Figure 3-1). The DS Association consists of shallow to deep sloping loamy soils in wooded upland areas. The DCP Association consists of deep, level, loamy alluvial soils typically occurring in or near bottomlands along watercourses. The RVB Association consists of shallow to deep loamy and clayey soils typically occurring in prairie upland areas. Surface slopes within this association varies from nearly level to moderately steep. According to the soil survey completed in 1983 and updated in 1991 by the USDA NRCS, 89 acres were classified as prime farmland, which is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, oilseed, and crops. At the time Tinker AFB was surveyed, much of the land (approximately 300 acres) which would have been designated prime farmland had long since been urbanized and therefore no longer met prime farmland criteria.

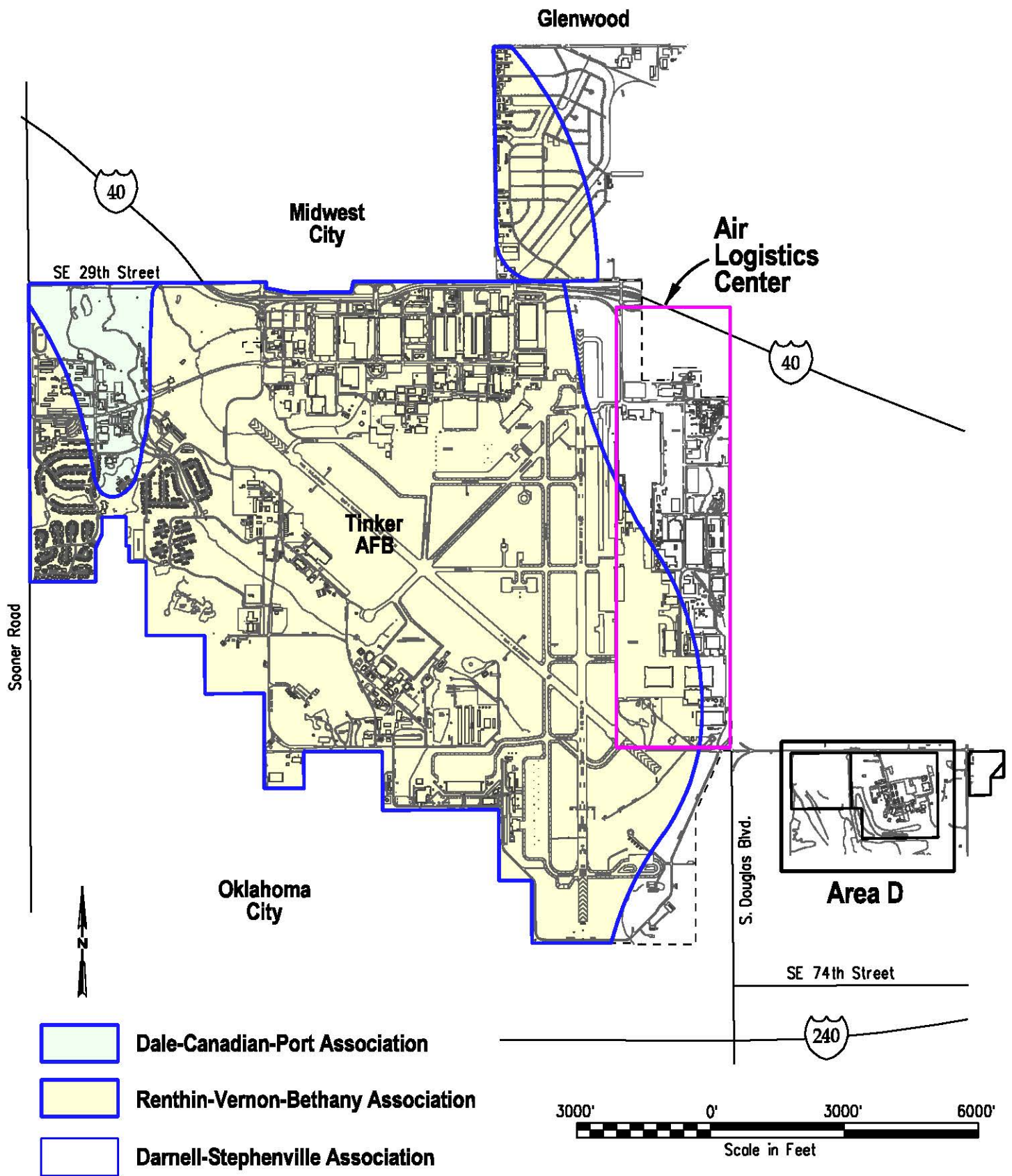
The sites for the proposed facilities within the ALA lie within the DS Association.

3.3.2 Air Quality

Tinker AFB and the surrounding area have a warm, temperate climate. Seasonal storms provide precipitation, with the heaviest amounts occurring in spring and summer. Spring and summer storms are often severe, with tornadoes occurring primarily in April and May.

3.3.2.1 Ambient Air Quality Conditions

The CAA requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. Primary standards protect public health, including the health



Source: USDA Soil Conservation Service, 1969

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of sensitive populations such as asthmatics, children, and the elderly. Secondary standards protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings (USEPA, 2007a). USEPA has established NAAQS for six principal pollutants, which are called “criteria pollutants” (Table 3-1). The Oklahoma Department of Environmental Quality (ODEQ) has adopted air quality standards that are identical to the NAAQS.

TABLE 3-1
NAAQS for Criteria Pollutants

Pollutant	Primary Standards ^a	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ^b	None
	35 ppm (40 mg/m ³)	1-hour	None
Lead	1.5 µg/m ³	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual (Arithmetic Mean)	Same as Primary
	35 µg/m ³	24-hour	Same as Primary
Ozone	0.08 ppm	8-hour	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	-----
	0.14 ppm	24-hour	-----
	-----	3-hour	0.5 ppm (1300 µg/m ³)

^a ppm = parts per million, µg/m³ = micrograms per cubic meter, mg/m³ = milligrams per cubic meter

Source: USEPA, 2007a

Areas that meet the air quality standard for the criteria pollutants are designated as being “in attainment.” Areas that do not meet the air quality standard for one of the criteria pollutants may be subject to the formal rule-making process and designated as being “in nonattainment” for that standard. In the past, particulate matter (PM) was divided into particles less than 2.5 microns in diameter (PM_{2.5}) and particles less than 10 microns in diameter (PM₁₀). However, in December 2006, USEPA removed PM₁₀ from the list of criteria pollutants due to lack of evidence linking health problems to long-term exposure to coarse particle pollution (USEPA, 2007a).

Nonattainment areas for some pollutants, including ozone, are further classified as regulated under Subpart 1 or Subpart 2, based on the magnitude of the problem. Subpart 1 (“basic” nonattainment) is applied to those areas where the problem is less severe and contains general requirements for nonattainment areas. Subpart 2 is applied to areas with severe problems and establishes a classification scheme for ozone nonattainment areas with more specific requirements. An area would be classified under Subpart 2 as marginal, moderate, serious, or severe based on the most recent 3 years of data. All other 8-hour ozone nonattainment areas are covered under Subpart 1 (USEPA, 2007b).

In the State of Oklahoma, ODEQ requires an Air Quality permit for facilities that have:

1. An “air contaminant source” with: “Actual emissions of five (5) tons per year (TPY) or more of any regulated air pollutant,” or
2. “An emissions unit, installed after 4/30/91, that is subject to federal standards (New Source Performance Standards or National Emissions Standards for Hazardous Air Pollutants).”

An “air contaminant source” is defined as any source of air contaminant emissions, both public and private. “Regulated air pollutants” include “criteria pollutants,” “hazardous air pollutants,” and “toxic air contaminants.” “Hazardous air pollutants” include pollutants regulated by Section 112 of the federal CAA. “Toxic contaminants” include toxic substances identified and regulated by state rules (ODEQ, 2008).

3.3.2.2 Air Pollutant Emissions in the Vicinity

Oklahoma County, which includes Tinker AFB and the surrounding areas, is located within the Central Oklahoma Air Quality Control Region (AQCR), and is in compliance with the NAAQS. The Central Oklahoma AQCR is in attainment for all priority pollutants.

Mobile sources are the single largest contributor of air pollutant emissions in Oklahoma County, with the exception of sulfur dioxide (SO₂). Area sources, which include homes and small businesses, are the major contributor of SO₂. Point source emissions contribute the least air pollutant emissions in Oklahoma County (Table 3-2).

There are no Federal Class I Prevention of Significant Deterioration (having degradation of ambient air quality), including strictly limited visibility, areas located in the Oklahoma City region (40 CFR 81.424).

TABLE 3-2
Air Pollutant Emissions by Source

Pollutant	Mobile Sources (tpy)	Area Sources (tpy)	Point Sources (tpy)	Total Emissions (tpy) ^a
Carbon Monoxide	234,797	7,593	1,697	244,269
Nitrogen Oxides	30,160	6,502	4,823	41,485
PM _{2.5}	4,117	3,383	189	7,690
Sulfur Dioxide	2,393	13,582	132	3,610
Volatile Organic Compounds	22,922	15,683	3,446	42,051

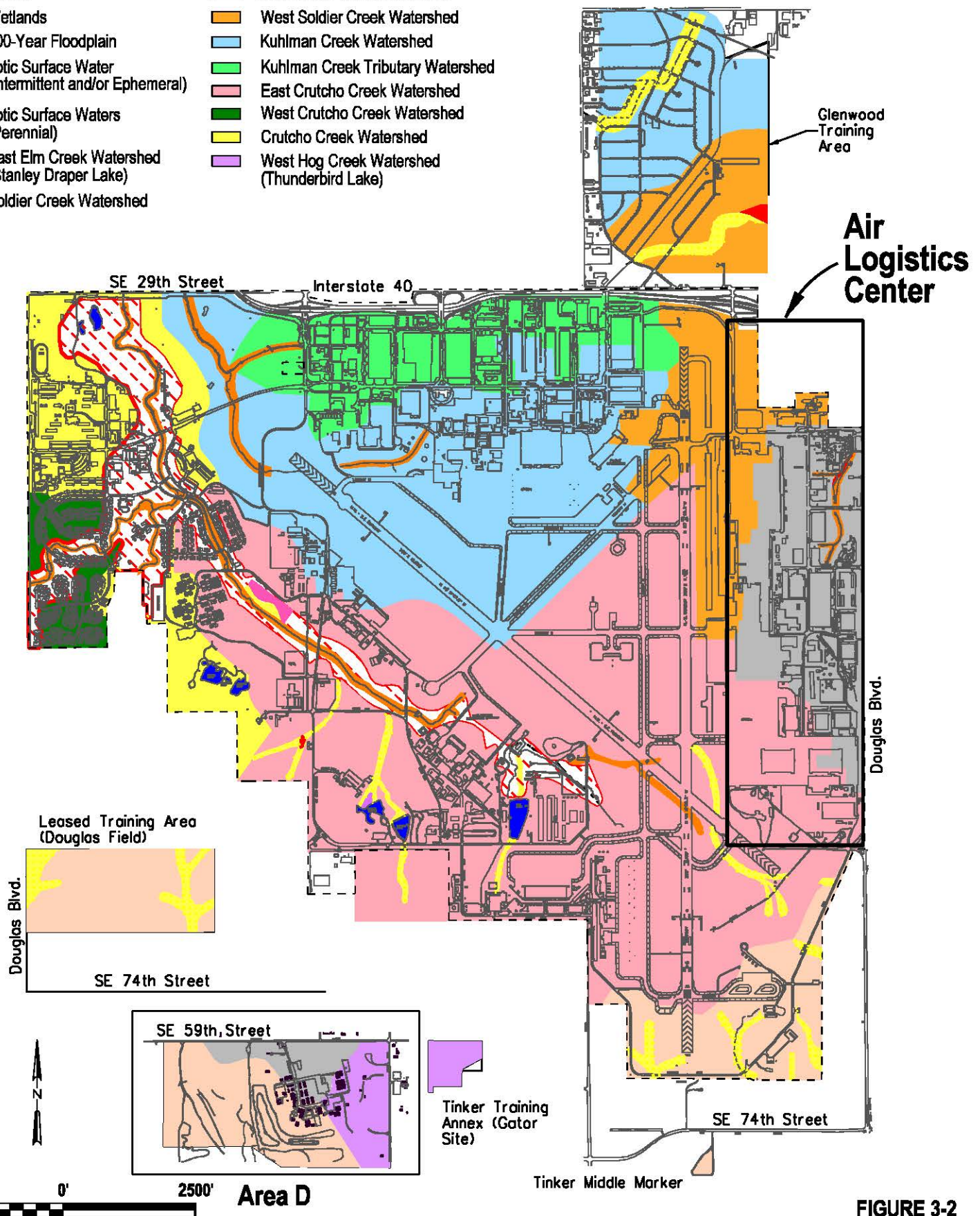
Source: Scorecard, 2008

^a Totals may not sum due to rounding

3.3.3 Surface Water

Surface water bodies at Tinker AFB, excluding wetland areas, consist of three creek systems and six permanent ponds (Figure 3-2). The major on-Base creek systems include Soldier Creek, Crutch Creek and its tributaries, and an unnamed creek locally referred to as

- Ponds
- Wetlands
- 100-Year Floodplain
- Lotic Surface Water (Intermittent and/or Ephemeral)
- Lotic Surface Waters (Perennial)
- East Elm Creek Watershed (Stanley Draper Lake)
- Soldier Creek Watershed
- East Soldier Creek Watershed
- West Soldier Creek Watershed
- Kuhlman Creek Watershed
- Kuhlman Creek Tributary Watershed
- East Crutcho Creek Watershed
- West Crutcho Creek Watershed
- Crutcho Creek Watershed
- West Hog Creek Watershed (Thunderbird Lake)



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FIGURE 3-2
 100-Year Floodplains and Surface Water Features
 Building 3001 EA
 Tinker Air Force Base, Oklahoma City, Oklahoma

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Kuhlman Creek. Most of the Base drainage is via the Crutch Creek system. Within the boundaries of Tinker AFB, Crutch Creek traverses approximately 8 linear miles. The Crutch Creek system originates south of the Base and flows northward across the Base, eventually draining into the North Canadian River several miles north of the Base.

No wastewater is discharged to surface waters on Tinker AFB. The Oklahoma City sanitary sewer system receives both untreated domestic wastewater and permitted discharges from the Tinker AFB industrial wastewater treatment plant (WWTP).

The extreme southeastern corner of Tinker AFB drains to Stanley Draper Lake, located about 1 mile south of the Base. Drainage in this portion of the Base is via Elm Creek and an unnamed creek, both of which are ephemeral.

One perennial stream in the northeastern corner of the ALA drains into the East Soldier Creek watershed.

3.3.4 Economic Resources

3.3.4.1 Employment

"Labor force" is defined as all persons residing in an area who are 16 years and over, employed or unemployed, excluding full-time students, homemakers, and retirees. In January 2008, the total labor force in Oklahoma County was 317,410 and the unemployment rate was 4.5 percent (Oklahoma Employment Security Commission [OESC], 2008a). The total labor force for the State of Oklahoma was 1,717,910, and the unemployment rate was 4.2 percent (OESC, 2008b). The Oklahoma City MSA reported a labor force of 549,320 with an unemployment rate of 4.3 percent in January 2008 (OESC, 2008c). The Oklahoma City MSA labor force makes up over 32 percent of the entire labor force in the State of Oklahoma.

Tinker AFB is the second largest employer in the Oklahoma City MSA, and the third largest employer in the State of Oklahoma (Oklahoma Department of Commerce, 2008).

3.3.4.2 Income

In 2006, per capita personal income in Oklahoma County was \$39,158, the second highest in the State. The per capita income of the County was 21 percent higher than the statewide per capita income of \$32,391 and 107 percent of the national per capita income of \$36,714 (Bureau of Economic Analysis [BEA], 2006). Per capita personal income is the sum of personal income, including wages and salaries, dividends, and transfer payments in an area, divided by total population. The average wage per job (wage and salary income divided by employment) in the Oklahoma City MSA was \$33,258 in 2007, compared to a statewide average of \$31,486 (BEA, 2007).

Total personal income in the County was estimated to be \$24.75 billion in 2005. Oklahoma County reported the largest total personal income in the State and accounted for 23.3 percent of the State total. Total personal income includes the earnings (wages and salaries, other labor income, proprietors' income); dividends, interest, and rent; and transfer payments received by the residents.

The Oklahoma City MSA had a per capita personal income of \$32,875 in 2005. This ranked 117th in the United States and was 95 percent of the national average. Total personal income

was \$37.97 billion, 36 percent of the total personal income in Oklahoma. Personal income in the MSA ranked 47th in the United States (BEA, 2005).

3.3.4.3 Installation Contribution to the Local Economy

In 2006, Tinker AFB had a total work force of 27,870 persons. This figure includes active-duty and reserve-duty military, civilian, and contract personnel. In addition to the Base work force, it is estimated that Tinker generates approximately 30,865 secondary jobs, most of which are within the Oklahoma City MSA. In 2006, Tinker's annual payroll of \$1.23 billion provided an estimated \$3.39 billion economic impact to the State of Oklahoma economy, of which \$3.14 billion was concentrated in the MSA (Midwest City Chamber of Commerce, 2007).

3.3.5 Utility Infrastructure

Base infrastructure components at Tinker AFB include the following systems: Water Supply and Distribution, Sanitary Sewer and Industrial Wastewater, Storm Drainage, Electrical, Central Heating and Cooling, Natural Gas, Liquid Fuels, and Solid Waste.

3.3.5.1 Water Supply and Distribution

The primary water supply source at Tinker AFB is a system of 22 operational wells located throughout the Base. The wells range in depth from 380 to more than 700 feet below ground surface, and yield between 200 to 250 gallons per minute (gpm) per well. The groundwater source at Tinker AFB is the Garber-Wellington Aquifer. At 75 percent capacity, these groundwater wells can supply a total of approximately 6.5 mgd of drinking water. The City of Oklahoma City is the backup water supply source for Tinker AFB. Oklahoma City provides water through two connection points on-Base. Usage of Oklahoma City water is limited to 2 mgd (Tinker AFB, 2007a).

The water supply and distribution system operates at less than 75 percent capacity and is in good condition. Planned improvements to the water system include:

- Replace dead-end lines and inaccessible valves in the Eastside Depot Maintenance District.
- Install appropriate pressure reducing valves on the water system so that the system is operated as a single unit rather than permanently closing gate valves to isolate different pressure zones within the drinking water system and leaving several miles of water main to stagnate due to lack of flow.
- Replace water lines that are nearly 60 years old in the following Districts: Northside Industrial, Southeast side Munitions, and Eastside Depot Maintenance.
- Update water storage requirements based on current building use profiles and updated fire flow demands. Additional storage and delivery facilities should be provided as required.
- Provide additional elevated storage in the Eastside Depot Maintenance District (south end) to increase system pressure and provide for expansion.

3.3.5.2 Sanitary Sewer and Industrial Wastewater System

The Tinker AFB sanitary sewer system does not contain any septic systems and the Base does not operate a sanitary WWTP. The system collects only industrial wastewater and is connected to the City of Oklahoma City wastewater treatment system. The wastewater system connection is through a transfer line that extends from the Industrial WWTP to the west side of the Base. The total wastewater flow rate is metered in the transfer line for billing purposes.

The collection system lines are clay-tile type pipe and were constructed in the 1940-1950 timeframe. The condition of the sanitary sewer system is fair. The majority of the wastewater collection system lines are composed of vitrified clay. Cast iron and PVC pipe are also used in the system, but represent only 7 percent of the collection lines on Base.

Numerous sewer mains need to be rehabilitated or replaced due to frequent pipe failures. In many areas, full replacement including upsizing of sewer lines is needed to accommodate anticipated future development.

Tinker AFB has programmed approximately \$3.4 million in sanitary sewer projects (Tinker AFB, 2007a). All of these projects involve the replacement of sanitary sewer lines in the Northside Industrial District.

The Industrial WWTP is operating at capacity. Due to the capacity limitations, construction or development projects that would result in additional wastewater requiring treatment at the onsite industrial facility, or any changes to the industrial wastewater infrastructure, must be approved by the Environmental Management Division and the City of Oklahoma City.

Several improvement projects are planned for the Industrial WWTP. The three largest improvement projects include:

- Replacing the U-53 Lift Station.
- Repairing the leak detection system and providing reclamation.
- Reusing the treated industrial wastewater for non-consumptive purposes on Base.

The City of Oklahoma also has planned a project to extend a new sewer line from the Industrial WWTP to the Oklahoma City connection on S.E. 29th Street (Tinker AFB, 2007a).

3.3.5.3 Storm Drainage System

The Tinker AFB Storm Drainage system is made up of a combination of natural and man-made features. The man-made features include curbs, gutters, culverts, and pipes. All stormwater on Base is conveyed to one of two drainage areas: Crutch Creek and the South Forty District. The South Forty District is actually part of the South Crutch Creek drainage area located on the south side of the Base, and contains natural and constructed retention areas to control runoff and flooding.

Tinker AFB has identified the need for drainage system improvements, including surface and subsurface drainage improvements in the area along Air Depot Blvd and Taxiway E (Tinker AFB, 2007a). These improvements are intended to complement the natural drainage

at this location. Other improvements include relocation of on-Base housing out of the 100-year floodplain of Crutcho Creek.

Soils at Tinker AFB typically provide very poor drainage, but the storm drainage system is in good condition and operates properly. The retention pond and basin system in the South Forty District provides adequate flood control and protection (Tinker AFB, 2007b).

3.3.5.4 Electrical System

Tinker AFB receives its electrical power from Oklahoma Gas and Electric, which delivers power through a looped 138-kilovolt transmission line. This transmission line provides power to each of the four substations on the Base. The Base maintains the distribution system. The electrical supply to Tinker AFB is adequate, and the electrical distribution system is in good condition (Tinker AFB, 2007a).

3.3.5.5 Central Heating and Cooling Systems

Central heating and cooling systems are powered by steam and chilled water plants located throughout the Base. Fuel oil and natural gas are the primary fuels used to power the steam and chilled water plants. The majority of steam-producing boilers are fueled by natural gas, with diesel fuel used as the backup supply. The steam line system is primarily underground, with a limited number of lines extending aboveground. The majority of condensate lines in the systems are also underground.

The heating and cooling machinery at Tinker AFB is in good condition and most units have excess capacity. However, due to the age of the distribution system, leaks are a major problem with the current system. Many of the distribution lines are only buried a minimal depth below the surface, and in some areas weather has eroded the ground cover and exposed the lines directly to the elements.

The only major planned improvement to the central heating and cooling systems is related to the Proposed Action. This project includes improvements to the boilers, chilled water system, and cooling tower in Building 3001 (Tinker AFB, 2007a).

3.3.5.6 Natural Gas

Tinker AFB purchases natural gas through a Government supply contract administered by the Defense Energy Supply Center (DESC). Geary Energy is the natural gas supply contractor for the Base, and Oklahoma Natural Gas Company (ONG) delivers the natural gas to the Base at three metered delivery points (Tinker AFB, 2007a).

The natural gas supply to the Base meets current needs and is adequate to provide for expansion. Most of the system consists of cast iron pipelines that are more than 60 years old. Many lines are corroded and in poor condition, resulting in instability in gas pressure in the distribution system (Tinker AFB, 2007a).

Tinker AFB has programmed over \$2.2 million in natural gas projects to improve the system and provide greater pressure stability (Tinker AFB, 2007a). The planned improvements include:

- Replacing 8-inch gas line from Building 18 to Building 2126

- Replacing gas lines and valves in the West Community District
- Replacing gas mains in the 38th EIG District
- Replacing gas valves throughout the Base
- Installing 27,000 linear feet (LF) of 8-inch main to provide a continuous loop system around the Base, including 14,000 LF of new pipe and 13,000 LF of pipe replacement.

3.3.5.7 Liquid Fuels System

A number of liquid fuels are stored onsite at Tinker AFB. Conoco supplies JP-8 (Aviation Fuel) through a 6-inch supply line below S.E. 29th Street northeast of Building 18, to the main tank farm. The following fuels are stored in bulk on Base: JP-8 (Aviation Fuel), JP-10 (Missile Fuel), PF-1 (Aviation Fuel), JP-5 (Aviation Fuel), Diesel Fuel, MOGAS (motor gasoline), fuel oil, biodiesel, deicing fluid, and calibration fluid.

One major improvement is planned for the Liquid Fuels System (Tinker AFB, 2007a). Four hydrant pits are planned for construction to provide full fueling and defueling capability. This fuel hydrant system is planned to connect to the ALA apron to enhance fueling operation efficiency. The Liquid Fuels System is adequate to meet the current mission requirements (Tinker AFB, 2007a).

3.3.5.8 Solid Waste

Tinker AFB generates a variety of solid wastes. All non-recycled household and office waste generated on Base is handled by a private contractor as part of a fixed-fee contract. The private contractor performs all waste pick-up and transports and disposes of the waste material at an off-Base licensed landfill facility. Construction and demolition debris is not included in this contract.

Consistent with DoD and Air Force policy, Tinker AFB is committed to reducing solid waste through recycling and reuse. The Defense Reutilization and Marketing Office (DRMO) operates a facility that processes recyclable materials such as scrap metals, automotive materials, and aircraft tires. This facility also accepts materials for reuse, transfer, donation, or sale.

The Tinker AFB Office and Household Recycling Program is administered by the 72 SPTG/SVFQ Division. The division maintains a facility that provides recycling containers to homes and offices and administers a curbside recycling program. Yard wastes are also recycled on Base. Yard waste is kept separate from household solid waste and is hauled to a location on the south side of the Base for composting (Tinker AFB, 2007a).

3.3.6 Transportation

3.3.6.1 Regional Roadway Network

Tinker AFB is located in the center of the State of Oklahoma approximately 5 miles southeast of the Oklahoma City central business district. A network of interstate highways, regional and local arterials, and local collector streets serve the Base (Figure 1-1). Interstate Highways 35, 40, 44, and 240 serve regional, interstate, and intrastate traffic in the region. I-40 extends east/west through Oklahoma City and provides direct access to the northern

gates by interchanging with several arterials and collectors that serve the Base. I-240 also extends east/west just south of the City and the Base, providing connections to I-35, I-44, and I-40. I-240 provides access to Tinker AFB via interchanges at Sooner Road, Air Depot Boulevard, and Douglas Boulevard.

Several major regional arterials surround the Base and provide local and regional access. S.E. 29th Street extends east/west and forms the northern border of the Base. Sooner Road and Air Depot Boulevard extend north/south and partially form the western boundaries of the Base. Douglas Boulevard, also a north/south arterial, forms the eastern boundary of the Base. S.E. 59th Street and S.E. 74th Street form the southern boundaries and serve east/west traffic. Table 3-3 presents traffic counts, expressed as annual average daily traffic (AADT) on the major roadways surrounding Tinker AFB and Tinker AFB access gates located along each stretch of roadway.

TABLE 3-3
Traffic Counts on Major Roadways Surrounding Tinker AFB

Along Road	Start	End	Year	AADT Count	Associated TAFB Gate
SE 29 th Street	Sooner Rd	I-40	2006	27,210	None
SE 29 th Street	I-40	Air Depot Blvd	2007	18,807	Tinker (Gate 1)
SE 29 th Street	Air Depot Blvd	Midwest Blvd	2007	18,807	Eaker (Gate 2)
SE 29 th Street	Midwest Blvd	Douglas Blvd	2007	15,229	Turnbull (Gate 3), Glenwood Gate, (Hruskocy Gate 7)
Douglas Blvd	I-40	SE 59 th Street	2007	13,786	Lancer (Gate 20), Liberator (Gate 21), Marauder (Gate 29)
SE 59 th Street	Sooner Rd	Air Depot Blvd	2007	4,811	Truck (Gate 33), Gott (Gate 34)
Sooner Road	SE 44 th Street	SE 59 th Street	2007	26,581	Patriot (Gate 39)
Sooner Road	SE 29 th Street	SE 44 th Street	2006	29,076	Vance (Gate 40)

Source: ACOG, 2007

3.3.6.2 Access to Tinker AFB

Access to Tinker AFB is via 12 gates located around the perimeter of the Base (Figure 3-3). Operations at the gates vary from 24 hours per day to fenced operations used on an as-needed basis. Eaker, Lancer, and Truck Gates are the most active gates and operate 24 hours per day. Vance Gate is open daily but closed overnight. Tinker and Gott Gates are open throughout the day on weekdays (except holidays). Liberator and Marauder Gates operate on weekdays only during peak traffic periods in the morning and afternoon.

Hruskocy Gate also is open only during peak traffic periods on weekday mornings and afternoons. Turnbull (Gate 3) is fenced and used only on an as-needed basis. Patriot

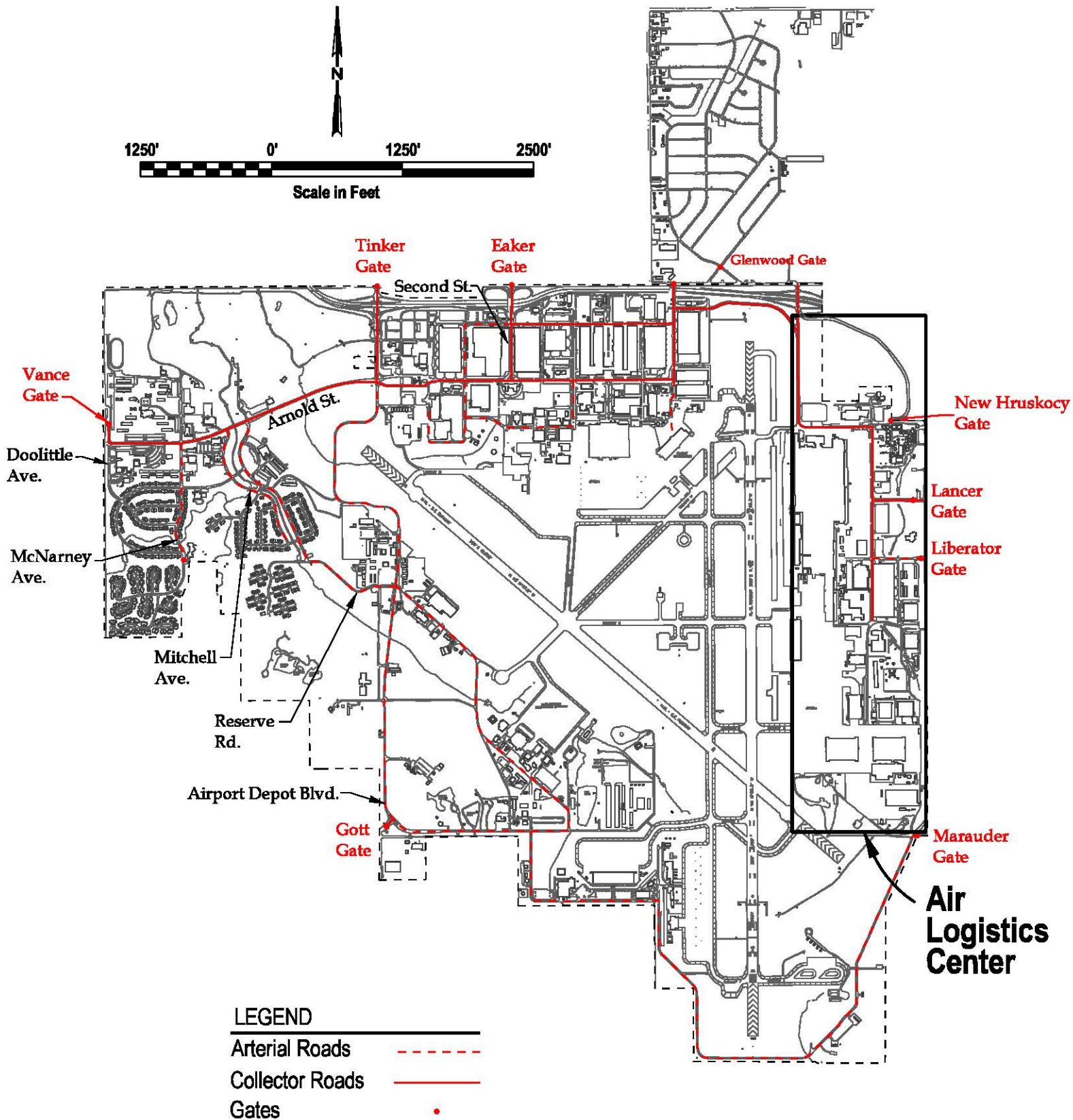


FIGURE 3-3
 Internal Transportation Network
 Building 3001 EA
 Tinker Air Force Base, Oklahoma City, Oklahoma

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(School) Gate is open weekdays throughout the school year (except holidays). Glenwood Gate is fenced and only used on an as-needed basis. Hope Gate accesses a satellite area of Tinker AFB called "Area D" located 0.5 mile east of Douglas Blvd on SE 59th Street. Hope gate is open from 6:00 am to 5:30 pm on weekdays (Tinker AFB, 2008).

3.3.6.3 Public Transportation

Public transportation external to the Base is provided by the Central Oklahoma Transportation and Parking Authority (COTPA), commonly referred to as Metro Transit. The Vehicle Operations Branch of the 72nd Air Base Wing operates Base-wide public transportation by a shuttle bus. The buses run on weekdays from 5:30 AM to 5:30 PM. Bus stops are located throughout the Base at peak demand locations, with shuttle service occurring every 60 minutes (Tinker AFB, 2007a).

3.3.6.4 Aviation

Two major airports and six minor airports/airparks facilitate air travel within the region. The major airports include Will Rogers World Airport, a major commercial carrier airfield located about 11 miles west of the Base, and Wiley Post Airport, a general aviation airfield located approximately 15 miles northwest of the Base. The minor airports/airfields in the area include the Downtown Airpark (Oklahoma City), Clarence E. Page Municipal Airport (Oklahoma City), Max Westheimer Airport (Norman), Sundance Airpark (Piedmont), Shawnee Regional Airport (Shawnee), and Guthrie-Edmond Regional Airport (Guthrie).

3.3.6.5 Railways

Rail operations in the area primarily serve the movement of freight. Services are provided by two railroads: Burlington Northern Santa Fe Railroad and Union Pacific Railroad. Amtrak has passenger service from Oklahoma City to Fort Worth where passengers can connect to Amtrak's nationwide rail system.

3.3.7 Hazardous and Toxic Materials and Wastes

Hazardous materials are substances that pose a potential hazard to human health or the environment if improperly used or managed. Hazardous wastes, as defined in RCRA, are substances with physical properties of ignitability, corrosivity, reactivity, or toxicity, which may cause an increase in mortality, a serious irreversible illness, or an incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous wastes are defined in 40 CFR 261 as any solid, liquid, or contained gas that can no longer be used or that is abandoned.

Hazardous materials and wastes are regulated by the USEPA in accordance with the Water Pollution Control Act, the CWA, the Solid Waste Disposal Act, TSCA, RCRA, CERCLA, and the CAA. The Federal government is required to comply with these acts and all applicable state regulations under EO 12088, DoD Directive 4165.60, Air Force Instruction (AFI) 32-7042, AFI 32-7086, and Air Force Pamphlet 32-7043, the Hazardous Wastes Management Guide. The TSCA provides policy for proper handling of PCBs, asbestos, radon, and LBP.

Tinker AFB is considered a large-quality hazardous waste generator. The majority of hazardous waste at Tinker AFB is generated during operations and maintenance activities (SAIC, 2004).

Tinker has approximately 1,200 hazardous waste collection sites and 400 hazardous waste staging areas. Approximately 4,000 tons of hazardous waste is generated annually at Tinker AFB. Hazardous wastes may be stored onsite in a permitted facility on Base or removed from the facility and disposed of by a licensed contractor. Two recently constructed facilities (Buildings 810 and Building 811) are permitted to house hazardous wastes for up to 1 year (Tinker AFB, 2007a).

3.3.7.1 Asbestos

The National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations established by USEPA at 40 CFR 61 Subpart M require that ACMs be properly removed prior to any demolition or renovation activity that may disturb them, if ACM is present in quantities above established threshold values.

All ACMs are managed under the Tinker AFB Asbestos Program. A copy of the Tinker AFB Asbestos Abatement Specifications is included as Appendix B. These specifications provide a list of required submittals, personal protective equipment (PPE), abatement material requirements, and information on proper disposal.

In Building 3001, suspected ACM has been abated from the air handling system (Feltman, 2008, personal communication). However, suspected ACM remains on approximately 93,250 LF of steam piping, chilled water piping, roof drains, and domestic water piping. Some roofing materials and cement-asbestos siding (Transite) are thought to contain ACM (Tinker AFB 2003). The Transite siding is in place along the vertical walls where air units and the rooftop utilities are located (Feltman, 2008, personal communication).

3.3.7.2 Lead Based Paint

The Tinker AFB "Building Revitalization Study" reported that LBP covered over 1.95 million square feet of structural steel, catwalks, ductwork, fan decks, and fire-suppression piping (Burns and McDonnell, 2003).

The USEPA has established regulations under RCRA that require Hazardous Material Generators to test waste streams to determine if the wastes must be classified, handled, and disposed of as hazardous waste. Any wastes containing LBP must be tested to ensure that they do not leach more lead than the USEPA-specified limit. If leaching limits are exceeded, the waste must be treated as hazardous (SAIC, 2004).

A copy of the Tinker AFB Lead-Based Paint Abatement Specifications for Industrial Facilities is included in Appendix C. These specifications reference the appropriate USEPA regulations and OSHA codes for LBP abatement and provide a list of required pre-abatement submittals.

3.3.7.3 Heavy Metal Dust

The Tinker AFB "Building Revitalization Study" reported that heavy metal contaminated dust on horizontal surfaces covered over 1.375 million square feet of structural steel, catwalks, ductwork, fan decks, light fixtures, and piping (Burns and McDonnell, 2003). The heavy metals in the dust samples were primarily composed of lead, cadmium, and chromium, but also included antimony, nickel, and silver (SAIC, 2004). Heavy metal dust is

the product of 50 years of metal work inside Building 3001 (Patterson, 2008, personal communication).

Any construction activity that contacts any of these surfaces would likely disturb the heavy metal dust and potentially expose workers to the dust. Tinker AFB would require contractors to collect dust through vacuum systems. All collected dust would be treated as hazardous and disposed of in accordance with the established policies at Tinker AFB (Tinker AFB, 2001; SAIC, 2004). The approach to working in proximity to heavy metal dust would follow the OSHA procedures for working with LBP, as both materials can produce fine particulates (Patterson, 2008, personal communication).

3.3.7.4 Contaminated Groundwater and Soils

Localized areas of contaminated soil, thought to have resulted from past industrial activities, occur below and adjacent to Building 3001. The primary contaminants are volatile organic compounds (VOCs), specifically trichloroethylene, but other contaminants such as chromium, lead, cadmium, and barium were also present in the soils (SAIC, 2004).

A groundwater plume, extending 10 feet to 40 feet below ground surface, is present beneath Building 3001. Approximately 90 percent of all soil below the surface of the building is contaminated based on core and vapor samples collected at the site. Tinker AFB does not currently have an established procedure for handling vapor intrusion (Flaming, 2008, personal communication).

3.3.8 Safety

3.3.8.1 Accident Potential Zones

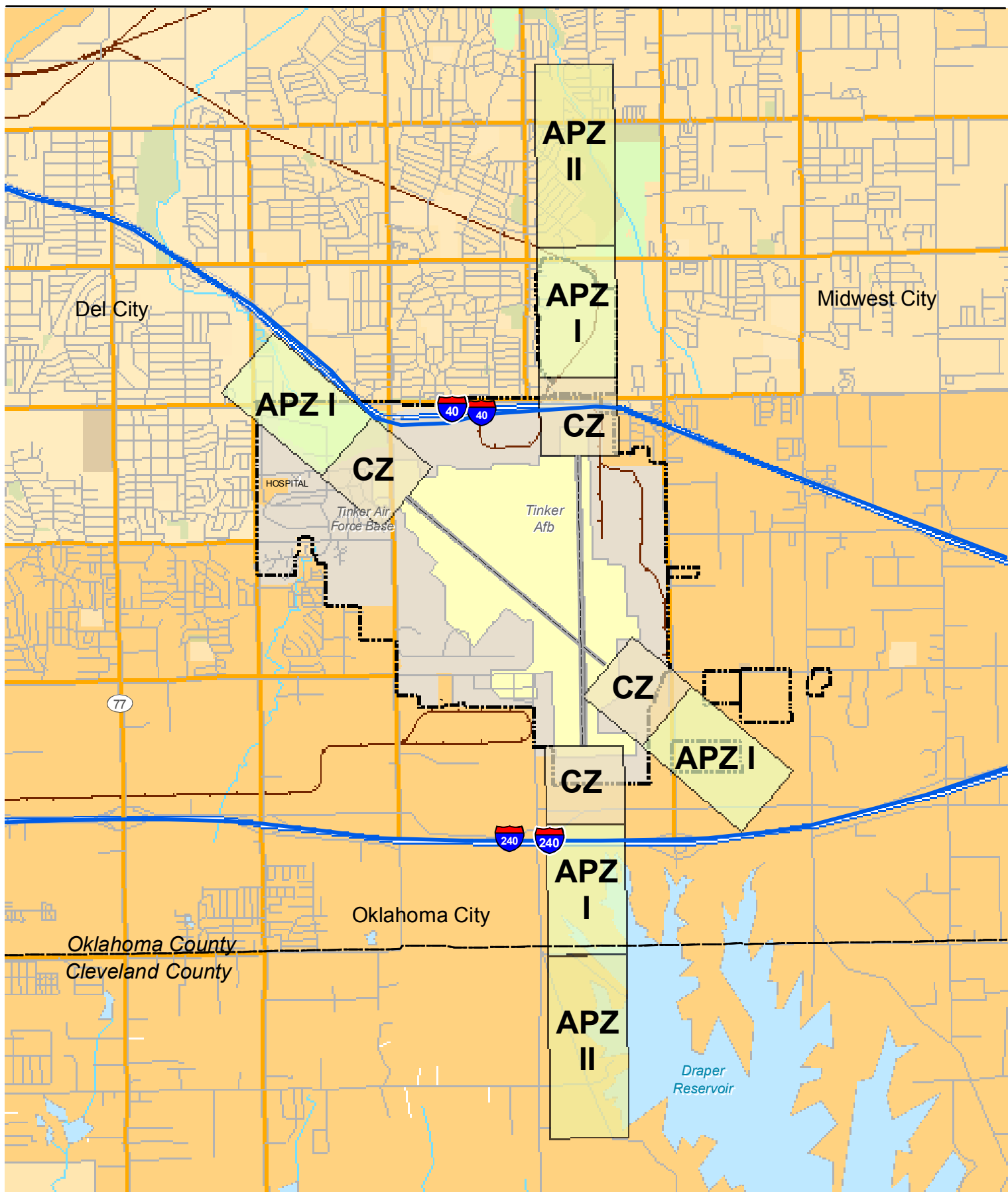
Air Force Air Installation Compatible Use Zone (AICUZ) guidelines include recommendations for clear zones and accident potential zones (APZs) around active airfields. The guidelines recommend land uses which are compatible with airfield operations, yet allow the maximum beneficial use possible of adjacent properties. DoD APZs identify the area immediately beyond the end of the runway as the Clear Zone, which is kept obstruction-free to minimize the risk of aircraft accidents. APZs I and II are the areas beyond the clear zone that have a significant or measurable potential for accidents. Land use in these areas must be compatible with the risk present in each of the APZs (Figure 3-4). The site of the Proposed Action (Building 3001) is outside the designated clear zones and APZs (Tinker AFB, 2006).

3.3.8.2 Occupational Health

The Air Force Safety Center (AFSC) develops and manages Air Force accident prevention programs. It develops regulatory guidance; provides technical assistance in the flight, ground, weapons, and space safety disciplines; and maintains the Air Force database for all safety mishaps. The AFSC oversees all major command mishap investigations and evaluates corrective actions for applicability and implementation throughout the Air Force. It also develops and directs safety education programs for all safety disciplines.

The AFSC Ground Safety Division manages ground safety policy, programs, and procedures to provide a safe work environment for Air Force personnel. The division researches, writes, and maintains Air Force Occupational Safety and Health standards to

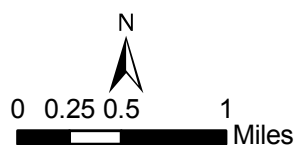
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SOURCE DATA: Tinker AFB GeoBase Program July 2006

Legend

- Runway
- Tinker AFB Boundary
- APZ I - Accident Potential Zone
- APZ II - Accident Potential Zone
- CZ - Clear Zone



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BEXAR\PROJ\EESBG\TINKER\370492_3001EA\MXD\370492_BLDG3001_CLEAR ZONES.MXD
11APRIL08

FIGURE 3-4

Clear Zones and Accident Potential Zones
Building 3001 EA

Tinker Air Force Base, Oklahoma City, Oklahoma

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ensure compliance with federal laws. In addition, the division evaluates final mishap reports and provides lessons learned and analyses to field units (AFSC, 2008).

Day-to-day operations and maintenance activities conducted on Tinker AFB are required to be in accordance with Air Force safety regulations, published Air Force technical orders, and standards prescribed by Air Force Occupational Safety and Health requirements.

3.3.8.3 Bird/Wildlife Aircraft Strike Hazard (BASH) Plan

Due to the significant populations of resident birds and the array of migratory populations, bird/wildlife collisions with aircraft present an occupational hazard at Tinker AFB.

Mitigation actions and operational procedures are outlined in the Tinker AFB BASH plan. The BASH plan provides guidance for reducing the potential for bird strikes in and around areas where flying operations are being conducted and is reviewed annually and updated as needed (Tinker AFB, 2007a).

3.3.9 Noise

Noise at Tinker AFB is typical of that associated with flying at most Air Force installations and civilian airports. During periods of no aircraft activity at Tinker AFB, noise from Base activities results primarily from aircraft maintenance and shop operations, ground traffic movement, occasional construction, and similar sources. The noise is almost entirely restricted to the Base and is comparable to sounds that occur in adjacent communities.

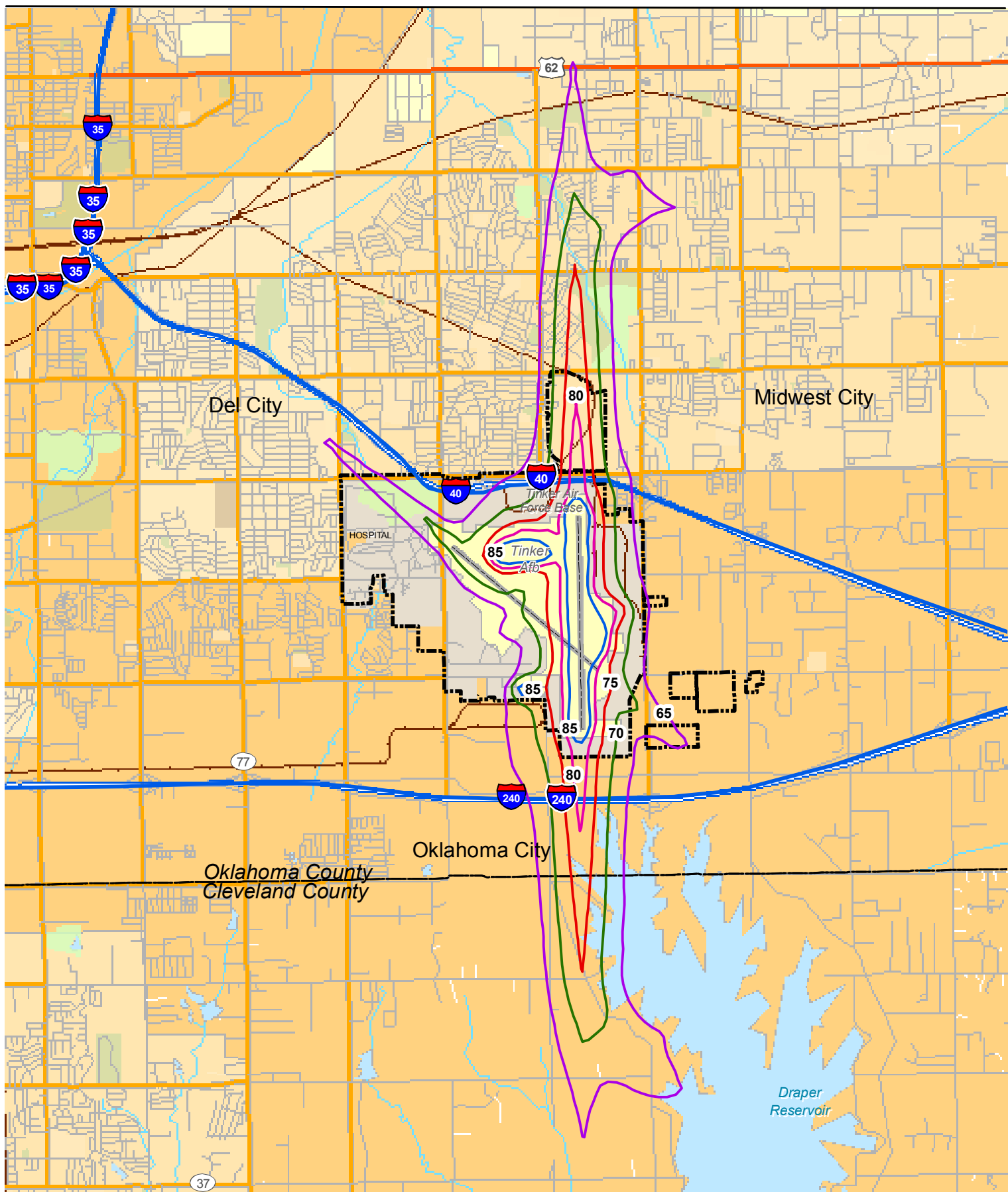
The primary noise concern at Tinker AFB is related to airfield operations. Aircraft take-offs, landings, and training activities are the primary sources of noise. DoD policy for addressing noise is implemented via AICUZ. DoD guidance for AICUZ establishes compatible land uses based on safety and noise thresholds. Land use guidelines include recommendations for four noise zones. The guidelines recommend land uses which are compatible with airfield operations yet allow for maximum beneficial use possible of adjacent properties (Tinker AFB, 2006).

The site of the Proposed Action (Building 3001) is within the 70 - 75 and the 75 - 80 A-weighted decibel (dBA) noise contours on Tinker AFB (Figure 3-5). Noise generated by the Proposed Action would result primarily from construction activities and noise associated with operation and movement of vehicles and heavy equipment. Noise analysis for potential effects is limited to the surrounding area (Tinker AFB, 2006).

3.3.10 Airspace/Air Operations

The DoD uses the AICUZ program to determine compatible land use in areas exposed to aircraft noise and potential aviation accidents. The standards, outlined in AFI 32-7063 (dated April 17, 2002), prescribe the minimum area required for a number of imaginary surfaces that surround the airfield at Tinker AFB. The purpose of the imaginary surfaces is to ensure safety and limit incompatible land uses near the airfield. The imaginary surfaces surrounding the runways are the Primary Surface, the Clear Zone Surface, the Approach/Departure Surface, the Inner Horizontal Surface, the Conical Surface, the Outer Horizontal Surface, and the Transitional Surface. Additional information on the imaginary surfaces surrounding the Tinker AFB airfield can be found in the 2007 update of the Tinker AFB *General Plan* (Tinker AFB, 2007a).

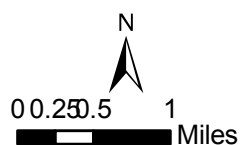
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SOURCE DATA: Tinker AFB GeoBase Program July 2006

Legend

- DNL 65 dB Contour
- DNL 70 dB Contour
- DNL 75 dB Contour
- DNL 80 dB Contour
- DNL 85 dB Contour
- Tinker AFB Boundary
- Runway



CH2MHILL

BEXAR\PROJ\ESBG\TINKER\370492_3001EA\MXD\370492_BLDG3001_NOISECONTOURS.MXD
11APRIL08

FIGURE 3-5

Average Busy-Day Noise Contours
Building 3001 EA

Tinker Air Force Base, Oklahoma City, Oklahoma

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Tinker AFB data from January 2006 show that more than 46,000 aircraft operations occur annually at Tinker AFB. An aircraft operation is defined as one takeoff/departure, one approach/landing, or half a closed pattern. This is equivalent to an average of 126 aircraft operations per day.

Daily closed pattern operations account for 76 percent of all average daily operations. The remaining 24 percent are daily arrival/departure operations.

Tinker AFB aircraft, including E-3, KC-135, B-52, and E-6 aircraft, make up a majority (69 percent) of total daily operations. Depot Maintenance Aircraft, including KC-135, E-3, B-52, and B-1 aircraft, make up only 2 percent of daily flight operations. The remaining 29 percent of operations involve various transient aircraft (Tinker AFB, 2006).

3.3.11 Cultural Resources

Two historic property types have been identified at Tinker AFB: facilities associated with aircraft construction and modification, 1942-1946; and facilities associated with the Cuban Missile Crisis, 1962. The Douglas Cargo Aircraft Manufacturing area has been designated as a Historic District. This area consists of a very large aircraft assembly building (Building 3001) and structures surrounding Building 3001 which contributed to the WWII wartime mission of the Douglas Cargo Aircraft Manufacturing Plant. This district contains 9 contributing resources (Table 3-4) and 12 non-contributing resources (buildings). The contributing elements make up about 90 percent of the area occupied by buildings within the district, primarily as a result of the size of Building 3001.

TABLE 3-4
Historic District Facilities

Building	Former Function	Current Function
3001	Douglas Assembly Building	Jet Engine Maintenance Shop
3102	Modification Hangar	Maintenance Hangar
3105	Paint Facility	Maintenance Hangar
3108	Paint Storage Facility	Aircraft & Engine Shop
3113	Woodworking Mill	Precision Machine Equipment Lab
3202	Fire Pump Station	Fire Pump Station
3203	Fire Protection Water Storage	Fire Protection Water Storage
3204	Switch Gear House	Civil Engineering Maintenance Shop
3303	Pump House	Pump House

The following buildings are considered Historically Significant Facilities: Depot Supply (Building 1), Steam Plant (Building 208), Airplane Repair Facility (Building 230), Test Hangar/Base Operations (Building 240), and Combat Control Center (Building 4029).

The Tinker AFB Cultural Resources Management Plan (Hardlines Design Company, 2005) addresses various types of maintenance, construction, and demolition activities and related compliance requirements.

There are approximately 131 known archaeological sites in areas adjacent to the Base, although no archaeological sites have been found on Tinker AFB. The area along Crutcho Creek is considered most likely to contain archaeological sites that may have been buried by flood deposits of the creek.

The proposed project is within the heavily disturbed ALA. While Building 3001 is part of the Historic District, the building is not recognized as an individual historical facility. No known archeological resources have been discovered in the area.

3.3.12 Aesthetics and Visual Resources

The project site is in an industrial area associated with the airfield. Views are typical of an airfield operational area, generally encompassing large-scale industrial facilities, aircraft, and vehicle parking areas.

4 Environmental Consequences

4.1 Introduction

The primary purpose of an EA prepared in accordance with NEPA is to identify the potential impacts of a major federal action on the environment. The identification of potential impacts includes consideration of both the context and the degree of the impact. When feasible, distinctions are made between short-term and long-term, and negligible and adverse impacts. A negligible impact may have an inconsequential effect or be unlikely to occur; an adverse impact would have negative consequences. If the action would result in improvement in the condition of a resource or reduction of an undesirable impact, the impact of the action is considered beneficial. Finally, a “no impact” determination is made when the Proposed Action would not noticeably affect a given resource. Where appropriate, cumulative impacts are discussed. Cumulative impacts are those that are likely to occur over a long period of time or as a result of combining the expected impacts of two or more unrelated actions.

This section is organized to present the potential environmental consequences in relation to the project site. The No Action alternative is also discussed in each subsection.

4.2 Effects of All Alternatives on Mission Objectives

In this discussion, the terms “Proposed Action” and “Preferred Alternative” are used interchangeably.

4.2.1 Preferred Alternative

Implementation of the Preferred Alternative would have a beneficial impact on mission objectives by improving the efficiency of maintenance operations inside Building 3001. The structural modifications, including the installation of a new hangar door and new concrete slab, would support the increasing demands on maintenance operations and enable faster turnaround in times of heavy maintenance, overhaul, and repair. Upgrade and replacement of the utility infrastructure would support the increasing demands on maintenance operations. Specifically, the utility upgrades would include the installation of a new rooftop enclosure to house utility lines and the replacement of chilled water supply lines which are currently inadequate to carry the volume needed for the new modern, energy-efficient chillers. Improvements to the chilled water supply system also would make the system more reliable and eliminate pipeline failures, which result in administrative office flooding and production delays.

4.2.2 No Action Alternative

Under the No Action alternative, maintenance operations would continue to be delayed due to the complicated logistics involved in maneuvering aircraft into and around the maintenance facility. Furthermore, the utility infrastructure would continue to degrade and

the possibility of another pipeline failure and flooding would remain. The newly installed chiller units would not be adequately served due to restrictions in the chilled water supply lines, and pipeline failures would be expected to continue to cause delays. The maintenance facility would be unable to increase maintenance production, potentially resulting in a lack of available aircraft for certain organizations. A situation where an organization cannot meet its mission objectives would be a significant adverse impact to the military mission.

4.3 Effects of Considered Alternatives on the Affected Environment

4.3.1 Topography and Soils

4.3.1.1 Topography

Preferred Alternative

The construction of the proposed facilities within the ALA would require excavation activities during replacement of the concrete foundations and slab in the area of the new hangar door. However, all areas slated for construction or rehabilitation are relatively flat and currently paved, and implementation of the Proposed Action would not alter the existing topography or change overall drainage patterns. Therefore, any impacts to topography would be negligible.

No Action Alternative

Under the No Action alternative, no excavation or grading activities would occur and no impacts to area topography would occur.

4.3.1.2 Soils

Preferred Alternative

Construction of the facilities associated with the Preferred Alternative would require soil disturbance during excavation activities related to the concrete foundation and slab replacement. The construction of the reinforced concrete foundations and slab may require the use of compacted subgrade and aggregate base along with soil removal. Construction activities for the Preferred Alternative would result in temporary impacts to onsite soils, which have already been heavily disturbed and paved over.

During soil disturbance activities, precautions would be implemented to minimize the amount of soils that must be removed from the site. Soil in the project area may be contaminated from a groundwater plume beneath the building. Any soils that must be removed from the site would be tested and treated as hazardous waste if contaminated (see Section 4.3.7). Exposed soils would be tested to determine whether contaminants are present and workers would be required to wear appropriate PPE until the soil is covered by sealed concrete.

Construction contractors would employ BMPs and engineering controls during construction and soil disturbance activities to eliminate soil loss. Because soils are already disturbed, construction activities would be temporary, and BMPs and engineering controls would minimize soil loss, any impacts to soils would be minor.

No Action Alternative

Under the No Action alternative, no construction activities would occur; as a result, there would be no impacts to soils in the area.

4.3.2 Air Quality

Preferred Alternative

Construction activities would result in short-term localized emissions from construction vehicles and fugitive dust. Various types of construction equipment would be used for demolition, excavation, grading, utility installation, paving, and hangar construction. Such impacts would be temporary and minor. BMPs would be used to control fugitive dust as required during construction. Temporary heating, ventilation, and air conditioning (HVAC) modifications may also be necessary during construction activities, and this would be considered a negligible, nuisance-level impact.

Demolition of the lean-to structure and removal of the concrete slab would result in generation of demolition dust. Appropriate BMPs to control dust generation during demolition activities would be implemented to minimize the potential for nuisance dust generation.

Exposure of soil during slab construction could result in release of vapors from the contaminated groundwater plume beneath the building. The work area would be isolated from the main part of the building, and air quality would be monitored during the period soils are exposed. Workers would be required to wear appropriate PPE if contaminated vapors are present. All concrete placed as part of the Preferred Alternative would be sealed to prevent vapors from groundwater from entering Building 3001 after construction is complete.

No Action Alternative

Under the No Action alternative, the existing facilities would continue to be used, resulting in no impacts to air quality.

4.3.3 Surface Water

Preferred Alternative

The proposed construction would have no long-term impact on surface waters because there are no surface waters at or in the vicinity of the construction area. However, stormwater runoff from areas disturbed during construction has the potential to increase turbidity, siltation, and sedimentation to receiving streams. BMPs, as presented in the *Tinker AFB Stormwater Pollution Prevention Plan* (Tinker AFB, 2007b), and engineering controls would be used to minimize impacts. Cumulative construction disturbance for the Proposed Action would be less than 5 acres. Due to the increase in roof area, stormwater runoff systems may need to be modified, but the post-construction volume of stormwater would be the same as current conditions because the amount of impervious surface area would not change. The increased roof area would be over surfaces that are already impervious. Any impacts to surface waters at Tinker AFB would be negligible.

No Action Alternative

Under the No Action alternative, the existing facilities would continue to be used, resulting in no impacts to surface waters.

4.3.4 Economic Resources

4.3.4.1 Employment

Preferred Alternative

The economic effects of a proposed military action are caused by a change in the demand for goods and services in the local economy. Primary effects are caused by initial changes in expenditures, employment, salaries, and population directly related to the Proposed Action. Secondary effects are induced by the process of spending and re-spending, and the relationship between what is needed to produce goods and services and the commodities that are produced.

The Preferred Alternative includes a number of small projects:

- New Hangar Door Related Improvements
 - Demolish existing lean-to structure on west side of Building 3001 to allow for construction of new hangar door
 - Replace existing concrete foundation with reinforced concrete foundation and slab in the area of the new hangar door
 - Construct long span roof structure to allow for re-sizing of doors
 - Install new hangar doors on west side of building
 - Paint all ceiling and roof supporting trusses
 - Install masonry veneer and low-slope built-up roof
 - Rehabilitate existing dock area
 - Replace roof in area of new construction
 - Remove old subroof rock wool insulation materials and supporting wire mesh
- Utility System Improvements
 - Remove and replace old pipes
 - Install rooftop enclosure to house utility lines
 - Upgrade existing secondary chilled water system to increase capacity and serve the entire industrial area

As the time frames for all of these projects are essentially the same (Fiscal Year [FY] 08-FY10), the economic impacts of their construction are considered together. Estimated construction costs for all projects total \$28,000,000.

Based on relationships found in the BEA data, it can be estimated that roughly one-third of the total cost would be expended for construction labor. Annual construction wages in Oklahoma averaged \$35,734 in 2007 (Bureau of Labor Statistics [BLS], 2007). Based on the estimated value of the construction cost and anticipated 30-month project duration, approximately 170 full-time equivalent construction jobs in FY08-FY10 would be generated, as estimated by dividing the amount to be expended for construction labor by the 30-month average construction wage. While there would be temporary job creation and increased secondary spending in the region resulting from the Preferred Alternative, the beneficial impacts would be temporary and minor. The estimated number of jobs during construction is less than 1 percent of the total employment at Tinker AFB.

There would be no long-term impact on Tinker AFB employment levels or employment in the region. There would be no permanent jobs created and no jobs lost as a result of the Preferred Alternative.

No Action Alternative

The No Action alternative involves the continuation of the present conditions without any new construction spending to address facility deficiencies. As such, no impacts to employment would occur under the No Action alternative, because no construction jobs would be generated and there would be no employment associated with staff additions.

4.3.4.2 Income

Preferred Action Alternative

Because no permanent increase in personnel is part of the Preferred Alternative, the economic effects of the action would be limited to temporary effects of construction-related jobs. Construction employment would be temporary. It is anticipated that approximately 170 full-time job equivalents would be created in FY08-FY10, which would be less than a 1 percent change in employment at Tinker AFB. Any impact on the local economy would be beneficial, minor, and temporary.

Expenditures for construction-related materials and supplies would have a small short-term beneficial effect on the economy of Oklahoma City and the surrounding area. Businesses near Tinker AFB, such as gas stations and fast-food restaurants, generally benefit from additional sales to construction workers. These benefits would be minor and would end when construction is complete.

No Action Alternative

Under the No Action alternative, no construction-related income would be generated and there would be no change to income levels. Therefore, no impacts to income would occur under the No Action alternative.

4.3.4.3 Installation Contribution to the Local Economy

Preferred Alternative

The annual construction costs associated with the Preferred Alternative would be less than 1 percent of Tinker AFB's annual overall impact on the economy. The labor costs for the Preferred Alternative would also be less than 1 percent of Tinker AFB's total annual payroll. Overall, the total payroll at Tinker AFB would be unaffected by the Preferred Alternative because the individual components that make up the Preferred Alternative do not call for an

increase or reduction in personnel. Because the project does involve a small facility addition along with an increase in infrastructure capacity (chilled water,) some additional utility expenditures would occur due to these changes. However, such increases would be negligible compared to the overall impact of the installation on the local economy.

No Action Alternative

Because there would be no construction or employment change under the No Action alternative, there would be no impacts to the installation's contribution to the economy.

4.3.5 Utility Infrastructure

Preferred Alternative

Implementation of the Preferred Alternative would have a moderate temporary negative impact and a long-term moderate beneficial impact on utilities. Because the Preferred Alternative involves the location, removal, and replacement of existing utilities, temporary utility disruptions would occur in localized areas. Such impacts would result in temporary disruption of depot level maintenance activities, but would result in an upgrade of utility infrastructure and increased and more reliable future utility service.

Demolition of the existing lean-to structure (to accommodate the new hangar doors) would have an impact on the storm drainage system in that area. Some curbs, gutters, and pipes would likely need to be removed and relocated to accommodate the construction changes. Any impacts would be negligible and limited to the construction period.

Because no new personnel or staff would be added with the Preferred Alternative, there would be no increased demand on potable water use or domestic sewage services.

Increased efficiency in movement of aircraft in and out of Building 3001 with the new hangar door would be expected to result in decreased demands on building heating and cooling. There would also be less time with hangar doors open for aircraft movement, which would result in less heating and cooling loss to outside air and would allow the HVAC systems to work more efficiently. A long-term reduction in demands for natural gas and electricity for heating and cooling in the building is anticipated.

Upgrades to the supply pipes for the chilled water system would increase the capacity of the system, but would have a negligible impact on the overall volume of chilled water used. The larger supply pipes would have a beneficial impact by properly cooling the new, modern, energy-efficient equipment utilized in the project area.

Construction-related debris and waste would be generated during this project, and would be handled and disposed of by the construction contractor. Any impacts on the Tinker AFB or regional solid waste system would be negligible.

No Action Alternative

Under the No Action alternative, the existing facilities would continue to be used at current utility demand levels, resulting in no impacts to existing utilities or solid waste handling capabilities. However, utility infrastructure would continue to deteriorate, resulting in higher incidence of flooding, equipment failure, and maintenance delays. Cooling system outages may occur more frequently if the deteriorated chilled water pipes are not replaced.

4.3.6 Transportation

Preferred Alternative

The Preferred Alternative would not result in a change in the number of personnel assigned to Tinker AFB. There would be no long-term impacts on traffic in and around Tinker AFB. Tinker AFB would require construction personnel to access Tinker AFB via Lancer Gate or Hruskocy Gate, which are near the project area, to minimize the potential for traffic disruption. The construction traffic would result in a small, temporary increase in traffic in these areas. The project would also result in a minor increase in construction truck traffic at the Truck Access Gate near SE 59th and Air Depot Boulevard during the construction period.

Even assuming a worst-case scenario, in which all 170 construction personnel accessed the Base in their own personal vehicles every day via the Lancer Gate (total of 340 trips along Douglas Blvd to access the Base), this would only result in a 2.5 percent increase in vehicle traffic along Douglas Blvd (based on AADT counts from Table 3-3). However, some of these trips would be spread out among the other entrance gates and the overall increase in traffic would be negligible.

No Action Alternative

Under the No Action alternative, no additional traffic would be generated and there would be no effect on transportation at Tinker AFB.

4.3.7 Hazardous and Toxic Materials and Wastes

4.3.7.1 Asbestos

Preferred Alternative

The Preferred Alternative would involve the removal of some ACM and may result in an exposure to asbestos. Insulation for the chilled water piping, roof drains, and domestic water piping contains asbestos. Furthermore, some ACM occurs in roofing materials on Building 3001 and in the Transite siding in the upper parts of the building. All of these materials may be encountered during removal or demolition to prepare for construction of the new hangar door and while working on the utility system, including the chilled water piping. To minimize potential impacts and exposure to ACM during construction, the contractor would be required to comply with the Tinker AFB Asbestos Abatement Specifications (included in Appendix B). No impacts from ACM would be expected as a result of the proper handling and disposal techniques that would be used.

No Action Alternative

Under the No Action alternative, the ACM would remain in place and undisturbed and no exposure to the ACM would occur.

4.3.7.2 Lead-Based Paint

Preferred Alternative

The Preferred Alternative may involve the removal of LBP-covered materials, including structural steel, ductwork, and piping. Due to the potential exposure to LBP during the project, the construction contractor would be required to follow OSHA procedures for dealing with LBP and the Tinker AFB Lead-Based Paint Abatement Specifications for Industrial Facilities (included in Appendix C). No impacts from LBP would be expected as a result of the proper handling and disposal techniques that would be used.

No Action Alternative

Under the No Action alternative, the LBP would remain in place and undisturbed, and limited exposure would occur.

4.3.7.3 Heavy Metal Dust

Preferred Alternative

The Preferred Alternative may involve the disturbance of heavy metal contaminated dust that covers structural steel, ductwork, and piping in the project area. To minimize the potential for exposure to dust, the construction contractor would be required to collect dust through filtered vacuum systems. All of the collected dust would be treated as hazardous and disposed of in accordance with the Tinker AFB Hazardous Waste Management Plan. Heavy-metal dust is hazardous due to the fine particulates in the dust. This is essentially the same type of hazard as that associated with LBP. As a result, contractors would be required to follow the same OSHA procedures for dealing with LBP, and Tinker AFB Lead-Based Paint Abatement Specifications for Industrial Facilities (included in Appendix C), to limit exposure to fine particulates. No impacts from heavy metal dust would be expected as a result of the proper handling and disposal techniques that would be used.

No Action Alternative

Under the No Action alternative, the heavy-metal dust would remain undisturbed and limited exposure would occur.

4.3.7.4 Contaminated Groundwater and Soils

Preferred Alternative

Implementation of the Preferred Alternative has the potential to expose construction workers and Building 3001 employees to groundwater and soil contaminants. Approximately 90 percent of all soil below the surface of Building 3001 is contaminated with VOCs such as trichloroethylene, and heavy metals such as chromium, lead, cadmium, and barium (Flaming, 2008, personal communication). A contaminated groundwater plume extends beneath Building 3001 at a depth of 10 ft to 40 ft below the floor of the building.

The replacement of the existing concrete foundation with reinforced concrete foundation and slab in the area of the new hangar door has the potential to mobilize contaminants in the soil. This presents an occupational health and safety hazard to construction workers and Building 3001 employees.

Tinker AFB does not currently have an established procedure for handling vapor intrusion but a procedure would be developed prior to construction. Proper engineering controls would be implemented during construction to limit any contaminant exposure to construction workers or Building 3001 employees. The reinforced concrete slab that would be poured to support the large aircraft that would use the new hangar door would be sealed across the bottom along joints with adjoining concrete to prevent creation of a path for vapors to enter Building 3001.

Due to the hazardous nature of the soils beneath the project site, any soil excavated during the project would be required to remain onsite during construction and eventually disposed of in an approved hazardous waste materials landfill.

No impacts from soil and groundwater contamination would be expected as a result of proper handling and disposal techniques that would be used during construction. The inclusion of a sealant in the design of the new concrete would create a vapor barrier, further limiting the impact of soil or groundwater contamination.

No Action Alternative

Under the No Action alternative, the contaminated groundwater and soils would be undisturbed and no exposure would occur.

4.3.8 Safety

Preferred Alternative

The ALA is located adjacent to a primary north-south runway at Tinker AFB, but outside of all designated accident potential zones (Tinker AFB, 2006). The Preferred Alternative does not involve any construction within any of the designated accident potential zones at Tinker AFB. As a result, there would be no safety impacts on these zones.

The Preferred Alternative may temporarily impact the occupational health and safety of some employees in Building 3001. Construction activities of any type require employees working near the construction zone to have a heightened awareness of their surroundings. All private contractors working at Tinker AFB must follow all applicable OSHA regulations and requirements that are applicable to the tasks being performed.

The Preferred Alternative would not impact any resident birds or migratory populations so there is no risk in an increase in potential bird/wildlife collisions with aircraft. As a result, the Preferred Alternative would have no impact on the Tinker AFB BASH program.

No Action Alternative

Under the No Action alternative, the existing facilities would continue to be used, resulting in no additional impacts to health and safety.

4.3.9 Noise

Preferred Alternative

The location of the Preferred Alternative (ALA) is within the 70 – 75 and the 75 – 80 dBA noise contours at Tinker AFB (Tinker AFB, 2006). The Preferred Alternative would have a temporary impact on noise levels around the construction site, which would result from construction activities and operation and movement of vehicles and heavy equipment. Workers would be required to wear hearing protection in accordance with established safety standards. Compared to the existing activities within Building 3001 and the noise generated from nearby aircraft operations, this additional construction related noise would be a minor temporary increase in noise.

No Action Alternative

Under the No Action alternative, the existing facility operations would continue and no additional noise impacts would occur.

4.3.10 Airspace/Air Operations

Preferred Alternative

Implementation of the Preferred Alternative would take place outside of the limits of imaginary surfaces designated for airspace safety. Therefore, the Preferred Alternative would not impact airspace operations.

Construction of the new hangar doors as part of the Preferred Alternative would add a crucial aircraft access point to the maintenance facility. These hangar doors would allow more efficient maneuvering of aircraft inside and outside of Building 3001. The Preferred Alternative would reduce the number of aircraft movements and in turn would eliminate some aircraft traffic conflicts and have a long-term beneficial impact on airfield operations.

No Action Alternative

Under the No Action alternative, the constraints on the existing aircraft access points would remain. While no impacts to overall airspace safety would occur, the No Action alternative would continue to have an adverse impact on airfield operations due to the continuous shuffling of aircraft outside of Building 3001.

4.3.11 Cultural Resources

Preferred Alternative

The Preferred Alternative is located within the developed ALA of Tinker AFB. The ground surface of the ALA has been heavily developed and disturbed in the past. The Preferred Alternative area of construction is completely paved and it is unlikely that grading, excavation, or utility replacement would unearth previously undiscovered archeological resources. In addition, the buildings proposed for additions are not recognized as historical facilities and no known archeological resources have been discovered in the area. Because of these reasons, no impact to cultural resources would be expected as a result of implementation of the Preferred Alternative. Should unknown archeological resources be discovered during the work, the Tinker AFB Procedures for Unexpected Discoveries of Archeological Materials During Construction Projects (Appendix D), as specified in the Integrated Cultural Resources Management Plan (Hardlines Design Company, 2005) would be followed.

Building 3001 is located within a Historic District and there could be impacts to that Historic District as a result of the Preferred Alternative. Tinker AFB is developing an MOA with the SHPO and the Oklahoma Archaeological Survey regarding the potential effects the Proposed Action may have on the Historic District containing Building 3001. Tinker AFB will implement all mitigation specified in the MOA once it is finalized. With implementation of the specified mitigation, any impacts to the Historic District would be minor.

No Action Alternative

Under the No Action alternative, the existing facilities would continue to be used, resulting in no impacts to cultural resources.

4.3.12 Aesthetics and Visual Resources

Preferred Alternative

The Preferred Alternative would take place in the ALA. The construction of the new hangar door would slightly modify the appearance of Building 3001, but the completed hangar door would be consistent with typical views of an airfield operational area. Therefore, any impacts on the aesthetics and visual resources of Tinker AFB would be negligible.

No Action Alternative

Under the No Action alternative, the existing facilities would remain and no impact to the aesthetics or visual resources would occur.

4.4 Cumulative Environmental Consequences

4.4.1 Definition of Cumulative Impacts

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 CFR 1508.7 (CEQ Regulations), a cumulative effect is the

impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

Some authorities contend that most environmental effects can be seen as cumulative because almost all systems have already been modified. Principles of cumulative effects analysis are described (CEQ, 2006) as follows:

For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties.

4.4.2 Cumulative Impacts

Because impacts would be limited to the Building 3001 area and the project would improve the ability to perform depot level maintenance on aircraft, there is limited potential for interaction with other projects. There would be no interaction with future projects with regard to natural resources because there would be no natural resource impacts after completion of the Proposed Action implementation. Tinker AFB would continue to consult with the SHPO, as appropriate, and implement cultural resources mitigation as required. This would prevent any significant cumulative impacts to cultural resources.

Multiple projects have been identified that would have the potential to interact with the Proposed Action. These include general construction improvements identified in the 2007 update to the *Tinker General Plan* (Tinker AFB, 2007a).

The construction of a new Hruskocy Gate immediately north of Building 3001 was recently completed. The gate construction consisted of two components: inside the gate, which is on Tinker AFB, and outside the gate, which involved county road improvements. Inside the gate, Tinker AFB completed roadway construction linking East Drive to the new Hruskocy Gate. A new security guard structure was built and security lighting was installed. Outside the gate, Oklahoma County is in the process of constructing a 4-lane street that parallels I-40 from the existing Hruskocy Gate, south to the new gate. Tinker AFB granted an easement to Oklahoma County for the improvements outside the gate. The area outside the gate will also be maintained by Oklahoma City. The new gate and improved roads will eliminate dangerous traffic backups along I-40 at the Hruskocy Gate exit (Tinker AFB, 2007c); Oklahoma County, 2007). These improvements would likely have a positive cumulative impact on traffic related to the Proposed Action. The new Hruskocy Gate will allow construction traffic to access Building 3001 and reduce congestion at other access gates around Tinker AFB.

Another area of potential cumulative impact is economics. The Proposed Action is part of an overall development plan identified within the Tinker AFB *General Plan* (Tinker AFB, 2007a). Projects in other areas of the installation are also being considered. Cumulatively, the implementation of these projects within the same general time frame would increase the amount of the Base's contribution to the local economy. Regionally, on a city or state level, the changes in employment, income, and other economic indicators as a result of collective Tinker construction projects would still be a relatively insignificant amount of the total regional economy, and would not represent any significant cumulative impact. However, it does not appear that all of the projects identified in the *General Plan* would be developed within the same FY. The only negative impact would be the potential for a number of concurrent construction efforts to tax the local construction industry and result in somewhat higher construction costs for the Base.

4.5 Summary of Mitigation Actions Planned

No long-term significant adverse effects were identified. As a result, no mitigation measures are planned. While no mitigation is proposed, certain project design features would be implemented to reduce potential impacts that would be less than significant even without those features.

Appropriate stormwater controls, as specified in the *Tinker AFB Stormwater Pollution Prevention Plan* (Tinker AFB, 2007b), would be implemented during construction to minimize the potential for stormwater runoff to contaminate offsite receiving waters.

Construction workers and Building 3001 personnel may be exposed to hazardous materials including ACM, LBP, and heavy metal dust under the Preferred Alternative. In order to minimize any effects from exposure, workers would be required to wear appropriate PPE and follow all OSHA and Tinker AFB regulations regarding working with and handling hazardous materials. Appropriate dust abatement BMPs would be implemented to minimize the generation of potentially hazardous dust.

Excavation and replacement of the concrete slab near the new hangar door may result in vapor intrusion from the groundwater and soil contaminants beneath Building 3001. Vapor

intrusion would be mitigated by isolating and monitoring the work area during construction, and then properly sealing the new concrete to prevent any vapor intrusion after construction is complete. All soil excavated during the project would be stored onsite and tested for contamination. Soil loss would be minimized with appropriate engineering controls and BMPs.

HVAC modifications and engineering controls would be implemented to minimize fugitive dust emissions generated during construction activities. Stormwater BMPs would be used to prevent surface water contamination from storm events. All utility disruptions, which would be necessary to replace and upgrade the outdated systems, would be temporary. OSHA regulations would be followed to protect occupational health, and appropriate PPE would be provided to all exposed personnel. This includes hearing protection (where necessary). Furthermore, the Tinker AFB inadvertent discovery procedures as specified in the Integrated Cultural Resources Management Plan (Hardlines Design Company, 2005) would be followed should unknown cultural resources be discovered during construction activities.

Mitigation for potential impacts to the Historic District containing Building 3001 is being developed through an MOA with the SHPO. The MOA is currently under development and Tinker AFB will implement any mitigation specified in the MOA once it is finalized.

4.6 Unavoidable Adverse Environmental Effects

There are no avoidable adverse environmental impacts that would result from the implementation of either the Preferred Alternative or the No Action Alternative. Unavoidable environmental impacts have been reduced to the extent practicable through design and implementation of appropriate BMPs.

4.7 Compatibility of the Proposed Action with Objectives of Federal, Regional, State, and Local Land Use Plans and Policies

The Proposed Action promotes the ability of Tinker AFB and tenant organizations to meet stated mission objectives. The Proposed Action consists of facility modifications and infrastructure improvements within an industrial area and is compatible with surrounding land uses. Projects making up the Proposed Action have been identified for implementation within the 2007 update of the Tinker AFB *General Plan* and are compatible with that plan. The Proposed Action is consistent with existing federal, regional, state, and local land use plans and policies.

4.8 Relationship Between the Short-Term Use of the Environment and Long-Term Productivity

The Preferred Alternative and the No Action alternative would not affect the long-term productivity of the environment. No significant environmental impacts or depletion of natural resources have been identified through this EA. Completion of the Proposed Action

would allow for Tinker AFB and tenant organizations to meet current and future depot level maintenance workloads. This would enable these organizations to better fulfill mission objectives, leading to greater long-term productivity and efficiency at the installation.

4.9 Irreversible and Irretrievable Commitment of Resources

The Proposed Action and the No Action alternative represent a commitment of fiscal resources during the construction process. Limited amounts of construction materials would be committed to the project, which would preclude their use for other projects. However, the quantities would be minimal and would not constrain other projects. No other irreversible or irretrievable commitment of natural resources has been identified through this EA.

5 List of Preparers

5.1 Tinker AFB, Oklahoma

Tim Taylor: Cultural Resources Program Manager/EIAP responsible for Cultural Resources compliance at Tinker AFB. Mr. Taylor has a B.S. degree in Zoology and an M.S. in Environmental Science with an emphasis on Fisheries from the University of Oklahoma. He has 6 years of experience as a planner working in the Cultural Resources Program at Tinker AFB and 4 years of experience working as an EIAP Program Manager. Other experience includes 6 years on the Spill Prevention and Response Team and serving as On-scene Commander for spill remediation, 2 years as Environmental Health Technician responsible for air and water quality monitoring at Tinker AFB, and 2 years as a Fisheries Research Technician at the University of Oklahoma.

5.2 CH2M HILL

Dr. Howard Saxion: Program Manager and senior environmental scientist responsible for technical senior review. Dr. Saxion holds Ph.D. and M.S. degrees in Environmental Sciences from the University of Texas at Dallas, and a B.S. degree in Biology from the University of Texas at Arlington. He has more than 20 years of experience in the preparation of NEPA documents, including environmental impact statements, air quality and noise impact assessments, regulatory compliance, and hazardous waste investigations. He is a Qualified Environmental Professional.

Kira Zender, AICP: Project Manager responsible for technical review, project coordination, and management. Ms. Zender has over 14 years of experience in project management, land use, and environmental planning. She has a Master in Urban and Regional Planning from Michigan State University and a B.A. in Urban Studies from New College/University of South Florida.

Dr. Richard Reaves: Senior Ecologist responsible for physical and biological resources. Dr. Reaves has over 14 years experience in environmental characterization and NEPA analysis/ document preparation. He has a B.S. in Wildlife Ecology and Resource Management from the University of Wyoming and a Ph.D. in Wetland and Wildlife Ecology from Purdue University.

Matt Mantell: Environmental Engineer/Planner responsible for economic resources, utility infrastructure, transportation, and hazardous and toxic material and waste issues. Mr. Mantell has over 3 years of experience in environmental planning and engineering. Matt has an M.S. in Civil Engineering, a Master in Regional and City Planning, and a B.S. in Geography from the University of Oklahoma.

Rudy De La Cruz: Senior Engineering Technician responsible for CAD technical support and creation of graphic illustrations for this EA. Mr. De La Cruz has over 20 years of

experience in general mapping services. His experience includes Cadastral Mapping, GIS, CAD/Design, and Environmental Mapping.

David Dunagan: Senior Technical Editor responsible for EA editing and document production. Mr. Dunagan has B.A. and M.A. degrees in English and 29 years of experience in technical publications.

6 List of Agencies and Persons Consulted or Provided Copies of the EA

- March 14, 2008, CH2M HILL received background information at the Project Kick-off meeting from the following personnel:
 - Carmie Ashley/72nd ABW/CEAR
- April 7, 2008, CH2M HILL staff contacted the following personnel to obtain background information for this EA:
 - Jason Flaming/72nd CEG/CEPR, Petroleum Storage Tanks Program Manager
 - Roger Feltman/72nd CEG/CEAN, Asbestos and Lead Base Paint Program Manager
 - Mark Patterson/72nd AMDS/SGPB, Industrial Hygiene
- April 18, 2008, CH2M HILL staff contacted the following personnel to obtain background information for this EA:
 - LouAnna Munkres/72nd ABW/CECR, Base Community Planner
- April 28 and May 5, 2008, CH2M HILL staff contacted the following personnel to obtain background information for this EA:
 - Adam Walko/72nd ABW/CEAN, Facilities Planner

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APPENDIX A

Notice of Availability

STATE OF OKLAHOMA, } ss.
COUNTY OF OKLAHOMA }

Affidavit of Publication

Arin Calame, of lawful age, being first
duly sworn, upon oath deposes and says that he is the A.E.
of The Oklahoma Publishing Company, a corporation, which is the publisher of the

The Oklahoman which is a daily newspaper
of general circulation in the State of Oklahoma, and which is a daily newspaper
published in Oklahoma County and having paid general circulation therein; that
said newspaper has been continuously and uninterruptedly published in said coun-
ty and state for a period of more than one hundred and four consecutive weeks next
prior to the first publication of the notice attached hereto, and that said notice was
published in the following issues of said newspaper, namely:

Th. 8/7 - Page 5

Subscribed and sworn to before me this 7th

day of August, 20 08

Danah Featherston
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My commission expires April 1, 2009



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405-275-2196 or 273-2818

Motorcycles

'06 Honda VTX 1300C, black, only 3000 miles, runs excellent, \$7,395 www.jonesoffroad.com 405-399-9005

'06 Harley Davidson Super Glide custom blk, screamin' eagle pipes, sale @ \$12,900 www.jonesoffroad.com 405-399-9005

'06 Honda CBR1000RR red/blk, all stock on 1,580miles, \$8695 www.jonesoffroad.com 405-399-9005

'06-'07 Yamaha TTR 230's, 4-stroke, electric start, 2 to choose, your choice \$2,695 www.jonesoffroad.com 405-399-9005

'06 Suzuki RM 125, 2-stroke, all stock, runs excellent, sale price @ \$2,695 www.jonesoffroad.com 405-399-9005

'06 Harley Davidson Electra Glide, blk, Vance & Hines pipes, exc cond, \$14,995 www.jonesoffroad.com 405-399-9005

'06 Yamaha 1900 Roadliner, 2 tone paint, all stock, 1900 miles, like new, \$11,900 www.jonesoffroad.com 405-399-9005

'06 Honda VTX 1800C, blk/red flames, all stock, 2010 miles, sale price \$9,995 www.jonesoffroad.com 405-399-9005

'06 HD Sportster Custom 1200, blk, lots of chrome, 9500mi, \$8800 405-826-7466

'06 Honda Shadow VT550 310mi Nearly New! \$5000 firm. 580-305-2230 405-640-4214

'06 Ultra Classic HD EC, 6500mi, like new, 1200 warr \$16,500 405-317-2823

'05 Harley Davidson Dyna Wide Glide, wht, 124" twin cam S&S motor, Baker Spd trans, 174 rear whl hp \$16900 www.jonesoffroad.com 405-399-9005

'05 Harley Davidson Softail Springer flat blk, apes, pin stripes, old school, \$13500 www.jonesoffroad.com 405-399-9005

'05 Harley Davidson Dyna Super Glide, red, Screamin' Eagle Heads, 3,730miles www.jonesoffroad.com 405-399-9005

'05 Harley Davidson Wide Glide FI custom HD paint, tons of extras, \$14,900 www.jonesoffroad.com 405-399-9005

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

'05 Harley Davidson 1200 custom, like new, asking \$7950 237-1800

Off-Road Vehicles & ATVs

'03 Yamaha Raptor 660R LE Low hrs, 100% stock. Stored indoors, w/ routine care. Nerf bars & lg helmet incl. \$3500 405-473-9617

'07 Yamaha YFZ 450's, blue or grey/red, both in great cond, starting @ \$5,095 www.jonesoffroad.com 405-399-9005

'04-'06 Kawasaki 700 V-Forces, fully auto trans, shaft dr., 3 to choose start @ \$3695 www.jonesoffroad.com 405-399-9005

'05-'07 Honda 400EX'S choose your color, 5 to choose starting @ \$3,695 www.jonesoffroad.com 405-399-9005

'07 Yamaha 450 Wolverine blk, low miles, 4x4, auto trans, sale price @ \$4,695 www.jonesoffroad.com 405-399-9005

'06 Honda TRX 250 EX Sportrax, 4stroke, sport clutch, w/rev, \$2,695 www.jonesoffroad.com 405-399-9005

'06 Polaris 250 Trailblazer, 2stroke, full auto, very low hours, wht/blk, \$2,850 www.jonesoffroad.com 405-399-9005

'03-'06 Yamaha 660R Raptors 4stroke, 4 to choose, as low as \$3,595 www.jonesoffroad.com 405-399-9005

'07 Honda TRX 450ER elect start, tons of extras! Runs great \$5,195 www.jonesoffroad.com 405-399-9005

'03-'07 Kawasaki 360 Prairies, choose your color, 5 to choose starting @ \$2,695 www.jonesoffroad.com 405-399-9005

'05-'06 Suzuki LTZ 250's, wht or yellow, starting @ \$2,695 www.jonesoffroad.com 405-399-9005

'08 Kawasaki KFX 450R, lime/bk, 4stroke, w/rev, good condition, \$5,495 www.jonesoffroad.com 405-399-9005

'08 Yamaha 250 Raptor man clutch, Spd trans, excellent beginner bike, \$3,195 www.jonesoffroad.com 405-399-9005

'07 Yamaha 350 Grizzly 2X4 green, fully auto trans, exc. condition, sale price \$3,395 www.jonesoffroad.com 405-399-9005

'06 Honda 400 AT Rancher 4x4, auto or ESP trans, vellow, only 359 miles, \$4,695 www.jonesoffroad.com 405-399-9005

'07 Honda 300 EX, 4stroke,

'07 Honda 3

APPENDIX B

Tinker AFB Asbestos Abatement Specifications

TINKER AIR FORCE BASE ASBESTOS ABATEMENT SPECIFICATIONS

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PART A

GENERAL

The requirements for asbestos abatement are stated herein. The drawings or statement of work associated with this project outline the work area that contains asbestos and the work to be accomplished. In case of conflict between the drawings and the specifications, the specifications shall govern. The following regulations, their appendices, memorandums, attachments and other appurtenant documents, which form a part of these regulations, shall apply in their entirety.

- A.1 Title 29 Code of Federal Regulations (CFR), Section 1926.1101 including all appendices and memorandums, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, latest edition.
- A.2 Title 40 CFR CFR part 61, Subparts A and M, National Emission Standards for Hazardous Air Pollutants, U. S. Environmental Protection Agency (EPA), latest edition.
- A.3 Title 29 CFR, Section 1910.134, Respiratory Protection (OSHA), latest edition.
- A.4 Title 40 CFR, Part 355.40, Emergency Planning and Notification, latest edition.
- A.5 Title 49 CFR, Part 172, Hazardous Material Tables and Hazardous Materials Communications Regulations, latest edition.
- A.6 The Asbestos Contractor shall have in his possession, at the job site and in view, one copy of each of the following: OSHA Reg 1926.1101, EPA 40 CFR, Part 61, subparts A and M, and Tinker AFB Asbestos Specification.
- A.7 Where a conflict exists between the requirements of this specification and any of the above-mentioned regulations, the most stringent shall be applicable.
- A.8 All Asbestos Contractors are encouraged to make a pre-bid site visit, to ensure familiarization with site conditions and the extent of the work requirements.
- A.9 Health Warnings: Asbestos Contractors are warned that unprotected exposure to asbestos fibers has been determined to significantly increase risk of incurring four diseases; lung cancer, gastrointestinal cancer, mesothelioma, and asbestosis. Care must be taken to avoid releasing or causing to be released, asbestos fibers into the atmosphere. The Government assumes no liability for damages, personal injuries, illness, disabilities or death to the Asbestos Contractor, Asbestos Contractor Employees, and other persons subject to the Asbestos Contractor's control or to any other person including members of the general public, arising from, or incident to the purchase, use, disposition, subsequent operations performed on, contact with or exposure to the asbestos, provided such is caused or contributed to in any manner by the Asbestos Contractor. Heat Stress: The

Contractor should also be aware that due to the nature of asbestos work, the wearing of respirators, impermeable clothing, material to be abated (steam lines, boilers, etc.), and containment could all add to heat stress.

- A.10 Property Damage: The Asbestos Contractor shall be responsible for all damages caused by or during the abatement. All damaged areas shall be restored to their original condition subject to approval by the Contracting Officer. Any repair or replacement shall be done at no cost to the Government.
- A.11 Quality Assurance: The Asbestos Contractor shall ensure all employees are knowledgeable of and comply with the procedures listed in this specification. Work shall not begin each day until a monitor from CE is on site.
- A.12 Glovebag Removal: Glovebags shall not be used on surfaces whose temperatures exceeds 150 Fahrenheit, shall not be larger than 60 inches X 60 inches and shall not be used more than once or moved after use. Two employees per glovebag and all employees monitored.
- A.13 HEPA Filters/Shower Filters: All filters shall be new at the beginning of the project.
- A.14 Negative Exposure Assessments: N.E.A. will not be implemented at Tinker AFB.
- A.15 All asbestos removal shall be supervised by a Competent Person and shall have daily air monitoring.
- A.16 Air Monitoring: The Asbestos Contractor shall use an independent laboratory for air monitoring and analysis support.
- A.17 Site Security: The Contractor shall be required to provide security at all Negative Pressure Enclosures after abatement has begun and until clean air has been established. This employee shall maintain the negative pressure enclosure, prevent unauthorized entry, watch for fires within the negative pressure enclosure, and guard Contractors material/equipment.
- A.18 Fire Protection: The work area shall have dry-charge ammonium fire extinguishers with a UL rating of at 10A:B:C, with a valid inspection tag for every 1500 square feet of area for Negative Pressure Enclosures and at least one extinguisher for every glovebag removal area.

PART B

DEFINITIONS

The following is a listing of terms and definitions for this specification.

- B.1 Class I Asbestos Work: Work activities involving removal of TSI, surfacing ACM, and PACM.

- B.2 Class II Asbestos Work: Work activities involving the removal of ACM, which is not thermal system insulation or surfacing material. Asbestos wallboard, floor tile, roofing, siding, shingles, construction mastics, etc.
- B.3 Class III Asbestos Work: Means repair and maintenance operations, where "ACM", including thermal systems insulation and surfacing material is likely disturbed.
- B.4 Abatement: Procedures to control fiber release from asbestos containing materials. This includes removal, encapsulation and enclosure.
- B.5 Abatement: Procedures to control fiber release from asbestos containing materials. This includes removal, encapsulation and enclosure.
- B.6 Air Monitoring: The process of measuring the fiber concentration of a specific volume of air over a specified period time.
- B.7 Airlock: An enclosure consisting of two polyethylene curtained doorways (3 sheets of plastic per doorway) at least 3 feet apart.
- B.8 Amended Water: A mixture of at least one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether in five gallons of water or an equal approved by EM.
- B.9 Asbestos: A group of naturally occurring minerals that separate into fibers. There are six asbestos minerals used commercially: chrysotile, amosite, crocidolite, anthophyllite, tremolite and actinolite and any of these minerals that has been chemically treated and/or altered.
- B.10 Asbestos Containing Material (ACM): Any material containing more than 1 percent asbestos.
- B.11 Asbestos Contractor: A private entity certified in asbestos abatement.
- B.12 Asbestos Fiber: A particulate form of asbestos 5 micrometers or longer with a length to diameter ratio of at least 3:1.
- B.13 Authorized Visitor: Any representative of a regulatory or other agency having jurisdiction over the project or anyone authorized by CEV and required by work duties to be present in the regulated area.
- B.14 Clean Room: An uncontaminated area or room which is part of the worker decontamination enclosure with provisions for storage of worker's street clothes and protective equipment.
- B.15 Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions and has authorization to take prompt corrective measures to eliminate the hazards. The Competent person must be an employee of the Asbestos Contractor and shall be named as that person in the project pre-abatement submittals. The Competent person shall

meet the criteria of the EPA's Model Accreditation Plan for Supervisors 40 CFR Part 763 and duties required by Subpart C of 29 CFR 1926.20 through 1926.32.

- B.16 Decontamination Enclosure System: A series of connected rooms and airlocks used for the decontamination of workers and of materials and equipment (i.e., airlock, clean room, airlock, shower, airlock, dirty or equipment room, airlock, work area).
- B.17 Demolition: The wrecking or taking out of any load supporting structural member and related asbestos containing materials.
- B.18 Employee: Any person working for the Asbestos Contractor who physically engages in the abatement of asbestos or performs a task on the job site.
- B.19 Encapsulant (Sealant): A material applied to asbestos containing materials to control the release of asbestos fibers by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components (penetrating encapsulant).
- B.20 Encapsulate: The application of a sealant to asbestos containing materials to control the release of asbestos fibers.
- B.21 Enclosure: The complete enclosing of asbestos containing material behind airtight, impermeable, permanent barriers.
- B.22 Equipment Room: A contaminated room which is part of the worker decontamination enclosure system used for storage of contaminated clothing and equipment.
- B.23 Friable Asbestos: Any material or combination of materials containing more than 1% asbestos that hand pressure can crumble, pulverize or reduce to powder when dry.
- B.24 General Contractor: Shall deem to exercise general supervisory authority over the work even though the General Contractor is not qualified to serve as the "competent person" as defined in 29 CFR 1926.1101 paragraph b. The General Contractor shall have the overall responsibility that his Subcontractor(s) are in compliance with this standard and all other regulations covering asbestos abatement.
- B.25 Glovebag: An asbestos labeled bag constructed of 6 mil or greater transparent plastic, two inward projecting long-sleeve rubber gloves, one inward projecting water wand sleeve and an internal tool pouch.
- B.26 HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers in diameter.
- B.27 HEPA Vacuum Equipment: Vacuuming equipment with a HEPA filter system.

- B.28 Load-Out Area: An area designated for controlled transfer of asbestos waste and equipment. This area can be adjacent to the equipment room or work area and must have two airlocks.
- B.29 Landfill (approved): An EPA approved site for the disposal of asbestos containing materials and other hazardous waste.
- B.30 Mini-Containment: A small enclosure intended for a small scale abatement procedure from the environment through negative air pressure, physical barriers, and/or other means, mini-containments will ordinarily not have an attached decontamination system.
- B.31 Negative Pressure Enclosure (NPE): An enclosure of the regulated area with a minimum of -0.02 column inches of water pressure relative to the outside area using HEPA filtered negative air pressure equipment, four (4) air exchanges per hour. This shall be maintained within the NPE as evidenced by a manometer. Air movement away from employees performing work. The NPE also has a decontamination facility and a load-out area.
- B.32 Negative Air Pressure Equipment: A portable local exhaust system equipped with HEPA filtration and capable of maintaining low velocity airflow into a contaminated area from an adjacent uncontaminated area.
- B.33 Objects: Fixed items are those which cannot be removed from the work area. Moveable items are those which can be removed from the work area.
- B.34 Non-Friable Asbestos: Any material containing more than 1% asbestos by weight that hand pressure can not crumble, pulverize or reduce to powder when dry.
- B.35 Presumed Asbestos Containing Material (PACM): Thermal systems and surfacing material found in buildings constructed no later than 1980, that the Government has not verified the absence of asbestos.
- B.36 Plasticize: To cover with plastic sheeting.
- B.37 Personal Protective Equipment (PPE): Disposable, impervious coveralls that are equipped with head and foot covers, gloves, and respirators.
- B.38 Regulated Area: The area surrounding the work area demarcated by danger warning tape and signs. All personnel entering the regulated area must wear full PPE.
- B.39 RACM: Regulated asbestos-containing materials.
- B.40 Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure with hot, cold, or warm-running water suitably arranged for complete showering during decontamination. Showers shall comply with 29 CFR 1910.141. All wastewater shall be filtered to the one (1) micron level prior to being discharged into the sewer system.

- B.41 Warning Labels and Signs: Signs and labels which conform to OSHA CFR 1910.1200 (f), and 29 CFR 1926.1101 (8).
- B.42 Wet Cleaning: The process of eliminating asbestos contamination by using cloth's, mops, or other cleaning tools which have been dampened with amended water.
- B.43 Work Area: A regulated area where asbestos is abated. A contained work area is sealed, plasticized and equipped with a decontamination enclosure system. A non-contained work area is not plasticized but is equipped with a decontamination enclosure system and is demarcated by danger warning tape.
- B.44 CEV: Environmental Management Division
- B.45 BE: Bio-Environmental Engineering.
- B.46 CE: Civil Engineering Directorate.

PART C

PRE-ABATEMENT SUBMITTALS

The Contractor shall submit all required pre-abatement submittals to the Contracting Officer at least five working days prior to commencement of work for review and/or approval. After completion of the submittal review, additional information may be required for clarification of or in support of documents submitted. The required submittal areas include, but are not limited to the following:

- C.1 Documentation of Training/Experience: All training must meet the criteria of 40 CFR 763 and 29 CFR 1926.1101. All abatement employees must be certified in accordance with 40 CFR 763 and 29 CFR 1926.1101, and certifications must be current throughout the contract period.
- C.2 Employee Physicals: All physicals shall be in accordance with 29 CFR 1926.1101. Prior to start of work copies of the examinations for each employee utilized on this project must be submitted to the Contracting Officer. All additional employees or those with expiration dates of the physicals before or during the construction project must submit updated physicals or have an immediate medical examination. Submittals must be received prior to start of work on this project. All submittal documents must be present and accessible for review at the project site.
- C.3 Regulatory Agency Notification: Verify that NESHAPS report (attachment) was received by the following agency and a copy of this verified report must be submitted to the Contracting Officer prior to start of work: The NESHAPS coordinator is located in Oklahoma City, the Compliance Section, Air Quality Division, Oklahoma Department of Environmental Quality, 4545 N. Lincoln, Oklahoma City, Oklahoma 73104.

- C.4 Security Documentation: Work area and equipment must be secured at all times to ensure no unauthorized persons enter regulated areas or asbestos storage areas. The Contracting Officer prior to starting the asbestos abatement must approve storage sites for all contractor equipment.
- C.5 Communications: The Contractor shall submit to the Contracting Officer a phone and/or pager number where the General Contractor's Supervisor (Competent Person) of the Asbestos Contractor may be reached at all times.
- C.6 Step-by-Step Abatement Procedures: This applies to friable and non-friable asbestos abatement procedures for each distinct location.
- C.7 Glovebag Procedures: The submittal for glovebag procedures shall include but not be limited to the following:
- Sizes and type of bags to be used.
 - Glovebag installation insuring leak-proof system.
 - Method used for smoke testing bag.
 - Type and manufacturer of negative air equipment.
 - Method to be used to maintain Negative pressure within the negative air bag.
 - Method used to provide makeup air without creating a fiber release.
 - Negative air bag design to insure work accomplishment while maintaining continuous negative pressure.
 - Composition of amended water or wetting agent used.
 - Bridging encapsulant used.
 - Manufacturer's specifications for HEPA vacuum.
 - Personal protective equipment (respirators, suits, etc.).
 - Method of regulating the work area (signs, barrier tape, etc.).
 - Procedures for removal of ACM within the negative air bag.
 - Method of support for wet ACM within the negative air bag.
 - Disposal method (storage type, location, transporter, landfill name and location, etc.).
 - Decontamination unit location with respect to the regulated area, water filtration and disposal.

- C.8 Negative pressure enclosure construction procedures, including drawings. Drawings will show layout of the containment, how containment walls are to be attached, decontamination unit, load-out area, location for negative air machines, structural design of the containment and materials used in the construction of the containment.
- C.9 Respirator Protection Program: IAW OSHA 29 CFR, Section 1910.134, 1926.1101 and ANSI Z88.2-80. Manufacturer's certification (including TC#) that all asbestos respiratory protective devices are NIOSH approved.
- C.10 Manufacturer's Certification: Vacuum's, air purifying equipment, negative air pressure equipment and other local exhaust ventilation equipment must conform to ANSI Z9.2-79.
- C.11 Encapsulation Procedures: Type of encapsulate, method of application and location. Asbestos encapsulants being used must meet the following minimum criteria:
- Penetrating Encapsulant, Class A fire rating, oil/chemical resistant, non-toxic when applied and colored.
 - Bridging Encapsulant, Class A fire rating, seamless, flexible, impact resistant, micro-porous, algae/mold resistant, oil/chemical resistant, bird/rodent proof, non-toxic when applied, colored and waterproof.
- C.12 Laboratory and Monitoring Requirements: The Asbestos Contractor must use an independent laboratory for air monitoring and analysis support (see part E, para 1.3 for required monitoring qualifications). Should the contractor change independent laboratories while the contract is in progress, the Contractor shall resubmit the qualifications/certifications of the new laboratory for approval by the Contracting Officer. The new laboratory must participate in the bulk asbestos analysis program with the National Voluntary Laboratory Accreditation Program (NVLAP) and shall have a good record in the program. The new laboratory must also participate in the Proficiency Analytical Testing (PAT) program with the National Institute of Occupational Safety and Health (NIOSH).
- C.13 Asbestos Waste Transporter Requirements: Certification of Insurance showing the transporter has \$1,000,000.00 Environmental Impairment and Transportation coverage as required by the State of Oklahoma. Certifications and physicals for personnel transporting and unloading material.
- C.14 Landfill Qualifications: Written evidence that the landfill for disposal of the asbestos is approved for the disposal of asbestos by the USEPA and they will accept the material.
- C.15 Material Safety Data Sheets (MSDS): A MSDS shall be submitted for all chemicals to be used on the project.
- C.16 Work Schedule: Provide starting date, completion date, days to be worked (weekdays/weekends) and hours to be worked. If the

abatement will be conducted at any time other than 0700 to 1600 hours, Monday through Friday, justification must be furnished and approved by the Contracting Officer. Requests for variance from this specification shall be in writing and submitted to the Contracting Officer at least ten (10) days in advance. Approval shall be at the discretion of the Contracting Officer.

- C.17 Emergency Plans and Fire Prevention Plans: As detailed in 29 CFR 1910.38.
- C.18 Written Hazardous Communication Program: As detailed in 29 CFR 1926.59.
- C.19 Rental Equipment: Provide a list of all rental equipment and written verification that the rental company has been informed that equipment is to be used for asbestos related activities.

PART D

ABATEMENT MATERIAL REQUIREMENTS

- D.1 Deliver all materials in the original unopened packages, containers or bundles bearing the name of the manufacturer and the brand name. Materials must be approved by the Contracting Officer before their use.
- D.2 Store all materials subject to damage off the ground and under cover to prevent damage or contamination. Material to be used on the project site shall not be stored in the same location where the asbestos waste is located.
- D.3 Damaged to deteriorating material shall not be used and shall be removed from the construction site immediately by the Contractor. The cost of the removal or disposal shall be the responsibility of the Contractor and at no cost to the Government.

PART E

AIR SAMPLING AND MONITORING ALL CLASSES OF REMOVAL

NOTE 1: Air monitoring shall be required by all Contractors on all asbestos projects on Tinker AFB.

NOTE 2: The Industrial Hygienists for the project shall be required to be at the project site while the Contractor is working.

- E.1 Air sampling data must include sample volume, sampling times, sampling locations (with appropriate dimensions and sketches), evidence of periodic inspection of sampling equipment, documentation of pre and post calibration of equipment, detailed description of work conditions, and description of worker protective devices.
- E.2 Laboratory analysis data must include sample identification, total sample duration, sample flow rate, total air volume, total

fibers counted, and total field concentration in fibers per cubic centimeter.

- E.3 All air sampling and monitoring shall be conducted by an Industrial Hygienist or an individual properly trained in air sampling and monitoring as determined by the Contracting Officer and be IAW OSHA 29 CFR, Section 1926.1101, Appendix A-OSHA Reference Method.
- E.4 The contractor shall request, through the Contracting Officer, that pre-abatement background sampling be obtained no later than 10 days prior to construction of abatement enclosure system. Should the contractor elect not to do background sampling then the clearance shall be less than or equal to 0.005 fibers/cc.
- E.5 Clearance Sampling is the Contractor's responsibility for collecting clearance samples to include one clearance sample for every 1500 square feet of work area, but as a minimum, one sample per room or distinct restricted area. The aggressive sampling method shall be used. Clearance shall be 0.005 fibers/cc or pre-abatement sample concentration, whichever is more stringent.
- E.6 Clearance Failure: Should clearance results fail the final clean-up requirements, the Contractor shall pay all costs associated with all required re-cleaning, re-sampling and analysis until final clean-up requirements are met.
- E.7 Blank samples shall include 10% field blanks or a minimum of 2 (two) field blanks as required by 29 CFR 1926.1101, Appendix A.
- E.8 A minimum of 1 (one) area sample from each work shift shall be collected for each 1500 square feet of work area or one sample for each restricted area.
- E.9 If at any time the results of the air samples taken by the Contractor or BE rise above the OSHA Permissible Exposure Limit (PEL), a confirmation asbestos fiber count will be required. If the confirmation count exceeds the PEL, the abatement will stop immediately and clean down procedures will be required. Cleaning will continue until air sample results are below the PEL.
- E.10 Personal Sampling: The Asbestos Contractor's Industrial Hygienist shall conduct personal sampling at all times.
- E.11 All personal samples must be taken at the breathing zones of persons who are performing asbestos abatement. The open face of the filter cassette must face downward during sampling.
- E.12 Twenty-five percent of the asbestos abatement employees must be sampled per work shift in each work area. A minimum of two personal samples must be collected each shift from each work area.
- E.13 Excursion limit: The Contractor shall ensure that no employee is exposed to airborne concentrations of asbestos in excess of 1.0 f/cc of air (1 f/cc) as averaged over a sampling period of thirty

(30 minutes, as determined by the method prescribed in 29 CFR 1926.1101, Appendix A.

- E.14 All personnel performing glovebag removal shall be subject to personal air monitoring.
- E.15 Contractor's shall submit air monitoring results to the Contracting Officer prior to the beginning of the next work shift.

PART F

RESPIRATORY PROTECTION

- F.1 The Contractor shall implement a respiratory protection program in accordance with 29 CFR 1926.1101 and 1910.134. All respirators shall be NIOSH approved.

PART G

CLASS I ASBESTOS REMOVAL, NEGATIVE PRESSURE ENCLOSURE (NPE) AREA PREPARATION

- G.1 Visually inspect area to be contained by the Negative Pressure Enclosure (NPE) and identify material to be removed. Locate any hazards that could harm Contractor employees or the containment.
- G.2 Post signs and tape as specified by OSHA 29 CFR 1926.1101 (k) (7) and 29 CFR 1926.1200 (f).
- G.3 Have CE Monitor or Construction Management contact the Civil Engineering Electrical Shop for the best location for the Contractors licensed electrician to hook-up the GFI and to lock-out and tag-out electrical circuits to work area without interfering with power to other Government operations.
- G.4 Shut down and seal with 2 layers of 6 mil plastic sheeting all openings, including heating, cooling, and ventilating air systems, to prevent fiber dispersal to other areas.
- G.5 Pre-clean movable objects from within work area(s) using HEPA vacuum and/or wet cleaning methods and remove from work area to a temporary location. Pre-clean fixed objects within the work area and plasticize with two (2) layers of 4 mil or greater plastic sheeting to provide an airtight, waterproof seal.
- G.6 Pre-clean the proposed work area(s) using HEPA vacuum and wet wiping method. Special attention should be paid to places/material that could hold asbestos fibers. Activities such as dry sweeping or vacuuming with non-HEPA filter vacuums are prohibited.
- G.7 After the area is pre-cleaned; cover the floor with two (2) layers of 6 mil plastic sheeting extending up the walls 12 inches. Cover walls with two (2) of 4 mil or greater plastic

sheeting overlapping floor sheeting 12 inches, with no butt joints. Should a roof (ceiling) be required for the containment, it shall consist of 2 layers of 4 mil plastic extending down the walls 12 inches. Critical barriers of minimum 3/8 inch plywood are required to separate the work area from adjacent occupied areas or in areas of heavy traffic.

- G.8 Assemble/construct decontamination unit consisting of a clean room, shower, and an equipment room (dirty room). Triple flaps will be used between each area of the decontamination unit. Shower facilities shall have liquid soap and shall comply with 29 CFR 1910.141(d) (3). Securely attach decontamination unit to the Negative Pressure Enclosure. On projects employing both female and male workers, the Contractor shall build separate decontamination units or stagger the work schedule to prevent embarrassment or harassment to either sex. Lockers shall be provided for street clothing. The Contractor shall maintain a containment log at the entry of the decontamination unit consisting of date of entry, name, time in, and time out.
- G.9 Install a sufficient number of HEPA filtered air machines to maintain a pressure drop of -0.02 inches of water within the enclosure and a manometer to verify the pressure drop. The manometer inlet tube shall be located in the NPE in an area to get a representative sample of airflow. One HEPA filtered air machine must be installed as a standby.
- G.10 The Contractor shall have a generator for backup power at all Negative Pressure Enclosure projects.
- G.11 The Negative pressure enclosure shall be inspected by CE prior to any removal of any asbestos containing material.

PART H

NEGATIVE PRESSURE ENCLOSURE, REMOVAL

The Contractor shall run a 30-minute excursion to ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 f/cc fibers over the 30-minute sampling period.

- H.1 Visually inspect enclosures at the beginning of each work period. Repair damaged barriers and remedy defects immediately upon discovery.
- H.2 Perform a daily wet cleaning of any area outside the work or restricted area, which becomes contaminated with dust or debris as a consequence of work, performed on that day.
- H.3 Should areas outside the work area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement employees' work practices, the abatement contractor shall be responsible for cleaning these areas in accordance with the procedures outlined in this specification.

- H.4 Start the HEPA filtered negative air pressure system and maintain a pressure of -0.02 inches of water. Do not deactivate until CE personnel grant final clearance. One backup HEPA filtered negative air pressure system must be installed in the work area to provide backup support in case of equipment failure. Each negative pressure system must be equipped with an audible alarm and an electronic mechanism which shuts off the system in the event of filter breach or absence of filter.
- H.5 High RPM power equipment, pressure washers or hydroblasters will not be used without approval from the Contracting Officer.
- H.6 Spray asbestos material with amended water using an airless sprayer. Saturate the material to the substrate without causing excess dripping. Spray the asbestos material repeatedly during work process to maintain wet condition and to minimize asbestos fiber dispersal. Water must not leak through the enclosure and contaminate adjacent areas. The Asbestos Contractor shall inform BE immediately if a health hazard is created during the abatement. This includes, but is not limited to, such occurrence as breaching the containment area, air monitoring results indicating airborne asbestos concentrations at unacceptable levels, accidents, etc.
- H.7 Remove all asbestos containing material identified in the statement of work. In all cases, asbestos-containing materials shall be removed in manageable sections and handled carefully. Material shall not be allowed to dry out. Material drop shall not exceed 15 feet. For heights from 15 to 50 feet, provide inclined chutes or scaffolding to intercept the drop. For heights exceeding 50 feet, provide enclosed airtight chutes.
- H.8 During the abatement, immediate cleanup and bagging of asbestos materials is required; the material must remain saturated until the waste container is sealed. Removed materials shall be double bagged in 6 mil plastic bags and sealed.
- H.9 Brushes utilized for removing loose asbestos-containing materials shall consist of nylon or fiber bristles only.
- H.10 Label containers in accordance with OSHA 29 CFR, Section 1926.1101. Wet pipe external surfaces of containers thoroughly. Move containers to load-out area and repeat wet cleaning.
- H.11 Should asbestos material extend past the limits of the containment and the removal process has exposed unprotected asbestos these areas shall be encapsulated with a heavy non-asbestos encapsulant $\frac{1}{4}$ inch thick overlapping existing end 4 inch sufficient to create a permanent seal.
- H.12 After completion of gross removal, wet brush and sponge all surfaces to remove visible asbestos-containing material. Surfaces being cleaned shall be kept wet with amended water. All asbestos contaminated water will be filtered through a 1 micron filter system prior to discharge. Discharge will be disposed of into a sanitary line or an industrial line. Discharge shall not be disposed of onto the ground or into a storm drain.

- H.13 Decontamination (cleanup): Cleanup materials (including mop heads), clothing and other disposable material used in the work area, shall be double bagged in 6 mil plastic bags and sealed for disposal as asbestos waste.
- H.14 Use rubber dust pans and rubber squeegees only to move and pick up material on the floor. Special care must be taken to minimize damage to floor sheeting.
- H.15 Wet clean and HEPA vacuum all surfaces in the contained work area. After all surfaces are dry, the cleaning procedure shall be repeated. Dry dusting or sweeping will not be permitted.
- H.16 After the second cleaning, a visual inspection will be conducted by the Construction Inspector. If the area is clean, approval shall be given to apply a lock-down encapsulant to the innermost layer of plastic only. No encapsulant shall be applied to the substrate from which asbestos was removed. If the area does not pass the visual inspection, it shall be cleaned again using the procedures outlined above until it does pass.
- H.17 After the lock-down encapsulant is dry, as verified by Construction Inspector; the innermost layer of sheeting shall be removed, double bagged, sealed and disposed as asbestos waste.
- H.18 After the innermost layer of plastic sheeting has been removed from the work area; the remaining layer of plastic sheeting shall be cleaned as outlined in paragraph H.12 of this part.
- H.19 After passing the second visual inspection, clearance samples will be collected. If clearance sample results are below 0.005 f/cc or pre-abatement sample concentration whichever is more stringent, CE approval will be given to apply lock-down encapsulant and the remaining layer of plastic sheeting. If the clearance sample results exceed 0.005 f/cc or the pre-abatement sample concentration, whichever is more stringent, the Contractor will repeat cleaning until an acceptable fiber count is obtained.
- H.20 After the lock-down encapsulant is dry, as verified by CE personnel, the final layer of floor poly will be removed while the final layer of wall poly is still in place and the negative air machines are still running. After the floor area has been inspected by CE, the negative air machine(s) may be turned off. The final layer of plastic shall be removed, double bagged, sealed, and disposed of as asbestos waste.

PART I

CLASS I ASBESTOS ABATEMENT, GLOVEBAG, NEGATIVE PRESSURE GLOVEBAG REMOVAL PRE-ABATEMENT PREPARATION

- I.1 Regulate and demarcate work area using warning signs or labels in accordance with 29 CFR 1926.1101(k). Means to ensure employee comprehension may include the use of foreign languages, pictographs, and graphics.

- I.2 Isolate HVAC system in regulated area sealing with a double layer of 6 mil plastic or greater.
- I.3 Deactivate electrical circuits within regulated area.
- I.4 Pre-clean area using HEPA vacuums and wet method, cover all non-movable objects with 2 layers of 6 mil plastic.
- I.5 Place impermeable drop cloths on all surfaces beneath removal activity.
- I.6 Construct and locate decontamination unit in central location to work area and within regulated area where feasible.
- I.7 Attach HEPA vacuum to glovebag and maintain negative pressure throughout removal.

PART J

CLASS I ABATEMENT GLOVEBAG REMOVAL

- J.1 Glovebag Removal Procedures: Two workers per glovebag. All workers performing glovebag work shall wear full PPE during the installation of a glovebag, removal of ACM and removal of the glovebag. All workers performing glovebag removal shall be monitored.
- J.2 Perform a daily wet cleaning of any area outside the work area or restricted area which becomes contaminated with dust or debris as a consequence of work performed on that day.
- J.3 Should areas outside the work area become contaminated with asbestos containing dust or debris as a consequence of the asbestos abatement employees' work practices, those employees shall be responsible for cleaning these areas in accordance with the procedures indicated in this specification.
- J.4 All removal tools and encapsulating supplies shall be placed in the glovebag tool pouch. Place glovebag around pipe, glue and tape edges to form an airtight seal.
- J.5 Install the sprayer wand and HEPA vacuum hose into the glovebag. Tape both to the bag for an airtight seal.
- J.6 Ensure that the glovebag is supported at the bottom to prevent separation caused by the weight of the wet debris (i.e., taping the bottom of the glovebag, platform to set the glovebag on, support bracket, etc.).
- J.7 Saturate all insulation within the glovebag with amended water prior to removing any insulation. The insulation shall then be removed and placed into the glovebag. The material must remain wet at all times to minimize fiber release. When all insulation is removed, the pipe shall be thoroughly scrubbed clean.

- J.8 After the pipe is clean; encapsulate all exposed edges of insulation and the pipe inside the glovebag. Spray inside of glovebag to wash all asbestos material to the bottom of the glovebag.
- J.9 Invert one glove and place tools inside it. Twist inverted glove and tape securely at elbow portion of glove. Cut the inverted glove through tape to separate from glovebag. Seal the cut end with tape. Deflate the bag with HEPA vacuum. Twist and tape glovebag near pipe. Carefully remove glovebag from pipe. Place glovebag in 6 mil plastic bag and tape to form an airtight seal. Tape the end of the vacuum hose.

PART K

CLASS II ASBESTOS WORK

- K.1 Asbestos gaskets, preparation, and removal: If gasket is visibly deteriorated and unlikely to be removed intact, removal shall be within a glovebag. Gasket(s) shall be immediately placed in a disposal container. Any scraping to remove residue must be performed wet.
- K.2 Transite clapboard and panels: Place 6 mil plastic sheeting below work site. Cutting, sanding, or grinding siding, shingles, or transite panels shall be prohibited. Wet material with amended water and remove carefully to minimize breakage. Material shall be wrapped twice in 6 mil plastic or double bagged in manageable bundles. Removal shall begin from the top and proceed down. Nails shall be cut with flat, sharp instrument.
- K.3 Floor tile/sheet vinyl procedures: Removal of vinyl asbestos floor tile which has been classified as "RACM" and asbestos containing sheet flooring must be accomplished using the following procedures:
- (1) Removal shall be done only by a licensed asbestos abatement contractor, using only certified asbestos abatement workers.
 - (2) Air monitoring shall be conducted.
 - (3) There shall be a decontamination shower adjacent to the work area or in a location convenient to the work area protected from the public.
 - (4) The work area shall be properly secured and marked.
 - (5) All air handling units affecting the work area shall be disabled.
 - (6) All electrical power within arm's reach of the floor shall be locked out or securely covered to prevent water intrusion or contact by workers.
 - (7) Critical barriers shall be erected.
 - (8) There shall be a minimum of one layer of 4 mil covering the walls.
 - (9) There shall be sufficient negative air machines in the work area to provide 4 air changes per hour. The negative air machines need not be externally vented.

- (10)Asbestos-containing adhesive may be removed by manually scraping.
- (11)Any water escaping from the work area shall be considered to have created a breach of containment and shall be handled accordingly.

- K.4 Transite pipe: Penetration of this material must be performed by certified asbestos abatement personnel. Exception: some penetrations may be performed by non-certified asbestos personnel when using tapping sleeves and valves. The following method is required for certified personnel: Regulate and demarcate work area using warning signs or labels in accordance with 29 CFR 1926.1101(k). Attach pipe cutter to pipe and apply amended water. Continue to apply amended water through the entire cutting process to minimize asbestos fiber release. HEPA vacuum and wet wipe the area after the work has been accomplished. Double bag the material and dispose of it as asbestos waste.
- K.5 Removal of Non-Friable Asbestos Containing Materials: The following materials may be removed by general contractor. The contractor shall employ a certified competent person to oversee the removal. The contractor shall provide its employees with Asbestos Awareness Training prior to removal and conduct a daily safety briefing. Removal procedures are outlined below:

Roofing materials (shingles, felt, tar, etc). Roof level heating and ventilation air intake sources must be isolated and the ventilation system shall be shut down. Roofing material shall be removed in an intact state to the extent feasible. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such methods are not feasible or will create safety hazard. Methods other than wet methods shall be approved by the Contracting Officer. Cutting machines shall be continuously misted. When removing built up roofs with asbestos-containing roofing felts and an aggregate surface using power roof cutter, all dust resulting from a roof shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along cutting line. Asbestos-containing material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is hand carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist. Intact ACM shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift; the lowered unwrapped material shall be transferred to a closed receptacle in such a manner so as to preclude the dispersion of dust. The roofing material may be disposed of in a conventional landfill provided the requirements of the landfill are met.

Vinyl asbestos floor tile (not classified as RACM); area preparation: A minimum of one layer of 6 mil poly shall be placed on walls prior to removal. During removal the floor tile shall be kept wet with amended water and keep breakage to a minimum. The floor tile shall be removed with hand scrapers (equipment such as power scrapers, chippers, and buffers are

prohibited). The floor tile shall be placed in 6 mil poly bags and put in a box. Seal the box and label it properly. Vacuums equipped with HEPA filters shall be used to clean floor of debris. The floor tile may be disposed of in a conventional landfill as construction debris.

K.6 Asbestos-containing ceiling tile abatement procedures shall be in accordance with Oklahoma Title 40 451-456. Removal of friable asbestos-containing ceiling tiles must be done using the following procedures:

- (1) Removal shall be done only by a licensed asbestos abatement contractor, using only asbestos abatement workers.
- (2) The ceiling tile removal may only be done when the area is not occupied.
- (3) All moveable objects must be removed from the room.
- (4) Decontamination facilities must be established, but need not be contiguous with the tile removal area provided.
- (5) Critical barriers must be erected.
- (6) Negative air machines in the removal area must be installed vented internally, and provide a minimum of one air change each 30 minutes.
- (7) The floor must be covered at least one layer of 6 mil poly.
- (8) Workers shall work in teams, with one worker removing and bagging tiles and one worker holding a HEPA vacuum near the grid.
- (9) Tiles must be doubled bagged in 6 mil asbestos marked bags and sealed with tape.
- (10) The tiles must be disposed of in an approved asbestos landfill.
- (11) The ceiling grid must be HEPA vacuumed and wet-wiped.
- (12) Air monitoring must be conducted.

PART L

DISPOSAL

- L.1 Asbestos contractor shall notify the Contracting Officer via the Construction Inspector in advance of the date and time that asbestos waste will be transported.
- L.2 To prevent exceeding available storage capacity on site, sealed and labeled containers of asbestos waste periodically shall be removed and transported to the disposal site.
- L.3 A completed generator label shall be placed on each bag, drum and wrapped component before transporting to the landfill site. Transport vehicle shall display Class 9 placards.
- L.4 All regulated asbestos waste shall be disposed of at an authorized site in accordance with regulatory requirements of EPA and applicable state and local guidelines and regulations.
- L.5 Wet wipe all containers in work area prior to transfer to load-out. Wet wipe containers again in load-out area prior to transfer to disposal vehicle.

- L.6 Personnel loading and unloading asbestos-containing waste shall wear full PPE. Workers removing asbestos waste from the abatement enclosure shall enter the load-out from outside. No one shall use the load-out as a means to leave or enter the work area.
- L.7 Drums/bags of asbestos waste and wrapped asbestos components that have been removed from the work area shall be transported directly to an EPA approved asbestos disposal site. Temporary storage of asbestos waste at an intermediate location is not permitted except under special authorization from CEV via the Construction Inspector.
- L.8 Asbestos transported in an open truck or trailer must be in 6 mil bags within sealed drums. Drums must be secured to prevent movement and shall not be loaded higher than the sidewalls of the vehicle.
- L.9 The cargo area of the truck shall be free of debris and lined and sealed with 6 mil plastic to prevent contamination.
- L.10 Large structural asbestos containing components shall be loaded and secured prior to loading bags. Do not throw items into truck cargo area.
- L.11 Any asbestos waste observed on containers or surfaces outside the work area shall be immediately cleaned using HEPA filtered vacuuming equipment and/or wet cleaning methods.
- L.12 Non-friable asbestos waste may be handled and transported by non-certified asbestos employees. Disposal shall be at an approved asbestos landfill provided the requirements of the landfill are met. All non-friable materials must be bagged/wrapped and boxed prior to transport.
- L.13 Transport Vehicles and Trailers shall have current vehicle licensing as required by State Law and display a DOT Class 9 placard.
- L.14 Transport Vehicles or Trailers shall be professionally constructed. Asbestos shall not be transported in make-shift vehicles.

PART M

POSTABATEMENT SUBMITTALS

- M.1 Within 10 working days after completion of work and prior to release from contract obligations with the USAF, the Asbestos Contractor shall provide the Contracting Officer:
 - A signed receipt from the waste disposal site operator stating date, time and amount (cubic yards) of asbestos waste received.

- A signed copy of all air sample results, from samples collected during the contract. (See Part E, Air Sampling and Monitoring).

PART N

HAZARDOUS PROPERTY DISCLAIMER

The Government cautions that asbestos containing materials, substances, or component parts thereof, which are being removed under this contract exhibit hazardous or toxic properties. The Government assumes no liability for any damage to the property of the Asbestos Contractor; any person or public property, or for the personal injuries, illness, disabilities, or death to the Asbestos Contractor or his employees, any other person subject to the Asbestos Contractor's control or any other person including members of the general public, arising from, or incident to, the purchase, use, processing, disposition, or any subsequent operation performed upon, exposure to or contact with any component, part, constituent or ingredient of this item, or substance or material whether intentional or accidental. The Asbestos Contractor agrees to hold harmless and indemnify the Government for any and all costs and expenses incurred incident to any claim, suit, demand, judgment, action, debt, liability costs and attorney's fees or any other request for moneys or any other type of relief arising from or incident to the purchase, use, processing, disposition, subsequent operation performed upon, exposure to , or contact with any component, part, constituent, or ingredient of this item, material, or substance, whether intentional or accidental.

- End of Attachment 2 -

APPENDIX C

Tinker AFB Lead-Based Paint Abatement Specifications for Industrial Facilities

TINKER AIR FORCE BASE LEAD-BASED PAINT ABATEMENT
SPECIFICATIONS

FOR INDUSTRIAL FACILITIES

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PART A

GENERAL

The requirements for lead-based paint abatement are stated herein. The drawings or statement of work associated with this project outline the work area which contains the lead-based paint and the work to be accomplished. In case of a conflict between the drawings and the specifications, the specifications govern. The following regulations, their appendices, memorandums, guidelines, attachments and other pertinent documents which from a part of these regulations shall apply in their entirety.

- 1.1 U. S. Environmental Protection Agency (EPA), latest edition, 40 CFR, Part 261 Identification and Listing of Hazardous Waste, 40 CFR, Part 268, Land Disposal Restrictions.
- 1.2 Title 29 CFR, Part 1910.134, Respiratory Protection (OSHA) latest edition, 29 CFR 1926.62, OSHA Lead Standard; Oklahoma Lead-Based Paint Management Act, Title 27A, O.S. Supp. 1994, Section 2-12-101.
- 1.3 Title 49 CFR, Part 172, Hazardous Materials Tables and Hazardous Materials Communications Regulations, latest edition.
- 1.4 29 CFR 1910.1025, General Industry Lead Standard
- 1.5 Where a conflict exists between the requirements of this specification and any of the above mentioned regulations, the most stringent shall be applicable.

PART B

PRE-ABATEMENT SUBMITTALS

At least five (5) days prior to commencement of lead-based paint removal in industrial areas; the Contractor shall submit all required submittals to the Contracting Officer for review/approval. After completion of the submittal review, additional information may be required for clarification of, or in support of documents submitted. Work will not commence until the Government has approved all submittals. Required submittals include, but are not limited to the following:

- 1.1 Removal procedures to be used.
- 1.2 List of materials to be utilized.
- 1.3 MSDS sheets for all materials/chemicals used.
- 1.4 Disposal Procedures

APPENDIX D

Tinker AFB Procedures for Unexpected Discoveries of Archeological Materials During Construction Projects

E.13 Unexpected Discoveries of Archeological Materials During Construction Projects

Although Tinker AFB may receive concurrence from the SHPO and other parties about its proposed undertakings at many points in the compliance process, Tinker AFB should also maintain the necessary resources to handle an unanticipated discovery.

An unanticipated discovery is defined as one found during a construction project in an area that has already been adequately surveyed or deemed not to require surveyance (with SHPO concurrence), and the site in question was not found during that survey. Unanticipated discoveries are usually archeological in nature, found when ground-disturbing activities uncover a new site in an area that has already been adequately surveyed. The following are the steps that are taken during an unexpected cultural resource discovery involving human remains:

1. The persons responsible for the activity that resulted in the discovery of human remains (construction contractor, permittee, etc.) stop all work in the area around the resource and notify the CRM. All work is not obligated to cease on the project, but every effort must be made to prevent further damage until an NRHP evaluation is completed and any mitigation activities completed.
2. The CRM notifies the Department of the Interior's Department Consulting Archaeologist (DCA) of the discovery, who must respond within 48 hours of notification. The CRM also notifies the SHPO.
3. The DCA (or a representative), in conjunction with the SHPO, will conduct an on-site inspection, during which time the DCA and SHPO will make an NRHP determination. If the determination is that the site is not eligible, then the work proceeds. If the site is eligible for the NRHP, then the DCA and SHPO will produce an appropriate mitigation plan. The eligibility determination and mitigation plan are produced within 48 hours of the initial DCA notification.
4. If the SHPO is unable to participate in the NRHP evaluation or the development of the mitigation plan, the SHPO will comment on the mitigation plan produced by the DCA.
5. If the SHPO and DCA cannot agree on the mitigation procedures, then the ACHP is asked to participate.
6. The CRM abides by the NRHP-eligibility decision and implements the mitigation procedures. The CRM arranges for project funds to be appropriated in order to carry out the mitigation plan.
7. Tinker AFB then selects a qualified contractor (see page 127) who completes the mitigation measures within a reasonable period of time. The CRM works with the selected contractor to coordinate the earliest time the base can resume work in the site area.

The following are the offices the CRM contacts in the event of an unexpected (emergency) discovery of human remains. The DCA is located in Washington DC and will usually send someone from a local NPS office to conduct the on-site inspection.

1. Departmental Consulting Archaeologist
Department of the Interior
National Park Service
P.O. Box 37127
Washington, DC 20013-7127
(202-343-4101)
2. National Park Service
Midwest Regional Office
1709 Jackson Street
Omaha, Nebraska 68102
(402-864-3431)
3. Oklahoma Historical Society
State Historic Preservation Office
2704 Villa Prom, Shepard Mall
Oklahoma City, Oklahoma 73107-2441
(405-521-6249)

E.13.1 Discovery and removal of human remains

Discoveries involving human remains will most likely come from an unexpected discovery made during the course of a ground-disturbing activity such as construction or an authorized archeological excavation. In the event of a discovery, it is imperative that all work in the area that might affect the integrity of the burial be terminated immediately. Because burials may fall under three possible categories—Native American, Euro-American, and recently interred—the guidelines below are used to determine what chain of command is to be followed.

The unexpected discovery of human remains requires the following steps:

1. The persons responsible for the activity that resulted in the discovery of the remains (construction contractor, permittee, etc.) stop all work in the area that could potentially have an adverse effect on the discovered human remains and simultaneously contact Security Forces (SF) and the CRM for consultation and implementation of the appropriate burial laws.
2. The CRM is then to notify a qualified Cultural Resources Specialist (referred to as “Specialist”) for the base. The Specialist then needs to first certify the receipt of notification of the burial, and then take immediate steps, if necessary, to secure and protect the discovered human remains and cultural items, including, as appropriate, stabilizing or covering [43 CFR 10.4(d)(1,2)].

3. Personnel hired or subcontracted by Tinker AFB for their special knowledge (e.g., history, architecture, archeology, etc.) must carry academic and professional qualifications in their own fields of competence and meet minimum criteria as established by the Department of the Interior's "Archaeological and Historic Preservation: Secretary of the Interior's Guidelines" (Federal Register 48(190):44716ff; September 19, 1983).
4. The Specialist and Security Forces are then required to determine the origin of the burial: Native American, Euro-American, or recently interred. Criterion a–c below are used to determine the next steps in each instance.
 - a. If it is determined that the burial is Native American, then the Specialist takes jurisdiction and follows the procedures pursuant to 43 CFR 10.5 (see page 131).
 - b. If it is determined that the burial represents an unmarked Euro-American burial, then follow steps 4 through 9.
 - c. If it is believed that the burial represents a recent inhumation that may be involved in a criminal investigation, then NCIS assumes jurisdiction.
5. CRM should consult with interested parties regarding identification, cultural or historical significance, eligibility determination for the NRHP, and treatment options.
6. CRM should consider the following issues when deciding whether to protect burials in place or relocate burials to an active cemetery:
 - a. land-use compatibility between burial grounds and mission;
 - b. public sentiment; and
 - c. cost of relocation.
7. If a decision is made to protect burial/cemetery in place, CRM or specialist actions should include:
 - a. literature search, professional archeological survey, and spatial mapping of individual burials;
 - b. identification of individual remains (if feasible);
 - c. formal designation of land as dedicated burial site; and
 - d. provision of access to descendants.
8. If a decision is made to relocate burial/cemetery in place, CRM or specialist actions should include:
 - a. literature search, professional archeological survey, and spatial mapping of individual burials;

- b. physical recordation of existing burial/cemetery (photographs, marker rubbings, oral histories);
 - c. consultation with next of kin or descendants of previous land owners;
 - d. acquisition of space for reburial;
 - e. exhumation by a qualified professional (in accordance with ARPA and its implementing regulations) using protective health measures for burial excavations;
 - f. reinternment by a qualified professional;
 - g. spatial mapping of new burial sites; and
 - h. documentation of compliance with ARPA and other applicable Federal, state, and local laws.
9. Tinker AFB may resume its activity 30 days after receipt of written confirmation, providing all state and federal rules have been met. A waiver of the 30-day work stoppage requirement is possible if there is a contingency plan in place.